

DATA HANDBOOK

Marine Engines

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General information

The Data Handbook describes Scania Engines current product programme, i.e. Industrial, Marine and Power generation engines, in three separate books.

The paper version of the Data Handbook is normally printed and sent to our subscribers four times a year. In between you find the latest version as PDF files in the Technical Information Library, TIL, at <http://til.scania.com> or via SAIL at <http://sail.scania.com>.

If you would like to start a subscription of the Data Handbook or just want to get in contact with the Product Information department at Scania Engines you find the contact details below.

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If you find incorrect information in the Data Handbook, you can use the Follow-up Report Administration System, FRAS, to report it. You can access FRAS at <http://distributorfras.scania.com> or via SAIL. You can also send an e-mail to the e-mail address above.

Rules and regulations

Scania will not take any responsibility for applications made not covered by the certificate(s) and type approval(s) of the engine.

Scania strives to ensure compliance of our products with regard to rules and regulations covering the application of our products. Given the variation of regulations and the complexity regarding final application of industrial and marine engines it is of outmost importance that precautions are taken to avoid any violation of local rules and regulations.

Emission compliance and classification

All engines are listed with their intended emission compliance and classification type approval. Engine compliance implies that the engine fulfils the emission regulation level, however this does not mean that the engine is approved and certified. Classification type approvals are valid for the bare engine. From a general point of view, no optional equipment from the Equipment lists or transmissions are part of the classified engine if not otherwise stated. For detailed information about approved and certified engines, access SAIL at <http://sail.scania.com> to view or download the appropriate certificate.

ISO 9001 and ISO 14001

Scania CV AB conforms with the Quality Management System Standard ISO 9001:2000 and the Environmental Management System Standard ISO 14001:2004. The certifications are valid for design, manufacture and marketing of trucks, bus and coach chassis and industrial and marine engines.



Power definitions

The marine engines have different power ratings depending on the type of service in which the engine will be employed. Our experience is that most of the power requirements are covered by ICFN, IFN and Patrol craft for marine all-speed engines and PRP for marine auxiliary engines.

Marine all-speed engines

The marine all-speed engines all have a "Flat power curve", i.e. they deliver full power over a wide speed range and provide extra power for acceleration and effortless planing at lower speeds. The wider speed range may also allow re-powering without exchanging the existing transmission.

ICFN, Continuous service

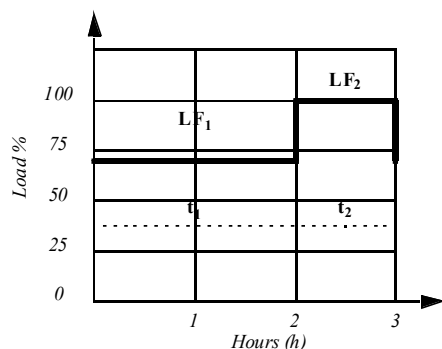
Rated power available 1 h/1 h. Unlimited h/year service time at a total load factor of 100%.

Power test code: ISO 3046, Continuous power, Fuel stop power, Net power.

(Dependent auxiliaries per ISO 3046 not accounted for. Presence or absence of equipment which affects the final shaft output of the engine, alternator etc., see ISO 3046-1, 3.1.1)

IFN, Intermittent service

Intended for intermittent use where rated power is available 1 hour/3 hours period. Accumulated load factor must not exceed 80% of rated power. Unlimited h/year service time. Total service time depends on load factor. See graph below for load factor vs. service time.



The graph illustrates that the load factor (LF_2) can be 100% for 1/3 of the time (t_2) that the engine is being used (for example 1 h of 3 h). For the rest of the time, 2 h of 3 h (t_1), the load factor (LF_1) has to be less, since the accumulated/total load factor must not exceed 80%.

Using the formula:

$$(t_1 \times LF_1) + (t_2 \times LF_2) = (\text{total time} \times 80\%) \rightarrow$$

$$(2 \text{ h} \times LF_1) + (1 \text{ h} \times 100\%) = (3 \text{ h} \times 80\%) \rightarrow$$

$$LF_1 = ((3 \text{ h} \times 80\%) - (1 \text{ h} \times 100\%)) / 2 \text{ h} = 0.7 \rightarrow 70\%$$

This gives a maximum load factor of 70% for the rest of the time (2 h of 3 h).

Patrol craft long

Intended for intermittent use where rated power is available 1 hour/6 hours period. Between full load operations engine rpm must be reduced at least 10% from max. obtained rpm. Accumulated total service time max. 2000 h/year.

Patrol craft short

Intended for intermittent use where rated power is available 1 hour/12 hours period. Between full load operations engine rpm must be reduced at least 10% from max. obtained rpm. Accumulated total service time max. 1200 h/year.

Power test code: ISO 3046, Fuel stop power, Net power.

(Dependent auxiliaries per ISO 3046 not accounted for. Presence or absence of equipment which affects the final shaft output of the engine, alternator etc., see ISO 3046-1, 3.1.1)

Marine auxiliary engines**PRP, Prime power**

For continuous operation and unlimited yearly operation time at varying load. Max. mean load factor of 70% of rated power over 24 h of operation. 1 hour/12 hours period of accumulated peak overload to 110%. Power definition acc. to ISO 8528. Power test code: ISO 3046, continuous power, Net power. (Dependent auxiliaries per ISO 3046 not accounted for. Presence or absence of equipment which affects the final shaft output of the engine, alternator etc., see ISO 3046-1, 3.1.1) ISO 8528. DIN 6280 Dauerbetrieb.

Other power ratings

Certain installations have other demands on power than those covered by ICFN, IFN, Patrol craft and PRP, for example engines with limited running hours, e.g. 500 h/y, but with mean output that might be high, e.g. engines for bow thrusters or engines with extremely few running hours and very high output requirements, e.g. fire pumps. For these types of installations, special considerations have to be made regarding cooling system, air intake etc. In such cases, please contact your Product Sales Manager at Scania. When we know more about the installation in question, we will help you to find a solution that fulfils your requirements on power and running hours as well as our demands on quality and reliability.

Reference conditions

When talking about output for an engine, it should be noted that the 'output' depends on a number of physical circumstances which always have influence on the engine performance. The outputs stated in the Data Handbook have been determined under certain given test conditions according to the international performance standard ISO 3046. Output and other technical data applies to an engine under the following conditions:

Atmospheric conditions

Barometric pressure: 1000 mbar
Air temperature: 25°C
Relative humidity: 30%

Fuel

Energy value: 42 700 kJ/kg
Density: 0.84 kg/dm³
Viscosity: 3.0 cSt at 40°C

For a new engine the brake output delivered may deviate from 'sold output' as ISO 3046 permits a tolerance of $\pm 3\%$. According to our experience the output will also increase with 1.5-2% after a running period of 50-100 h.



Output corrections

As we know that the physical circumstances may have considerable effect on the engine output we recommend that an output calculation is made for each engine. The output calculation will show if the output will be sufficient for the installation. In the output calculation the following must be considered:

Installation

- Intake underpressure (should not exceed 30 mbar)
- Exhaust back pressure (should not exceed 100 mbar)

Fuel

- Quality
- Temperature
- Density
- Viscosity

Intake air

- Temperature
- Barometric pressure

Output losses in driven equipment

- Transmission losses (gearbox/reduction gear). Losses are normally specified per unit.
- Other equipment connected direct to the engine (compressor, hydraulic pump, PTO, alternator etc.)

Output losses in generator (gensets)

- Losses due to generator efficiency

Output losses due to derating

- Derating for high altitude
- Derating for high ambient temperature

On the following pages you find more information about when and how to correct the sold output.



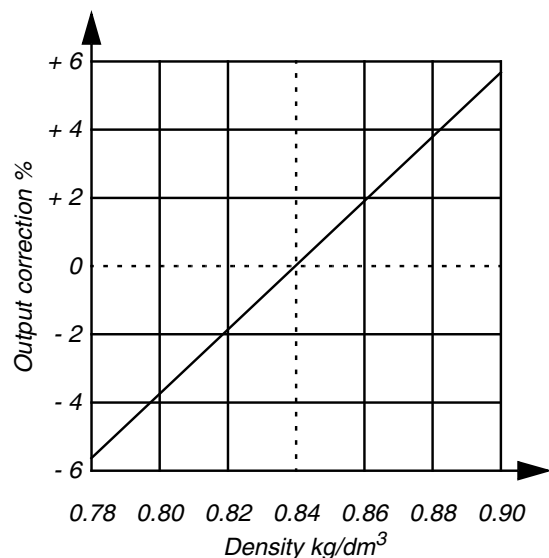
Output corrections due to fuel properties

Sold output presupposes the following fuel properties:

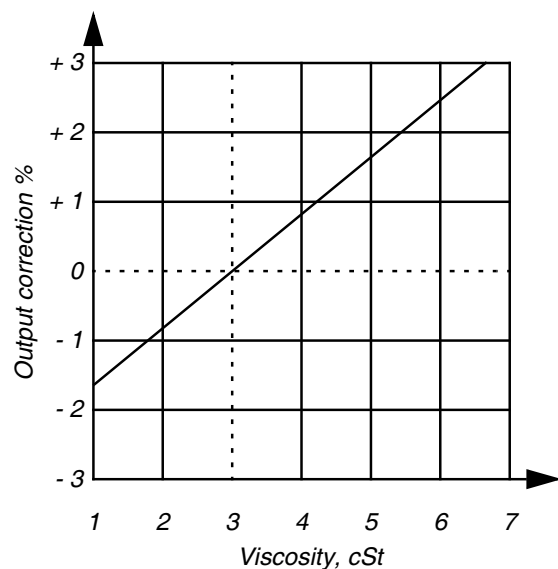
Energy value: 42 700 kJ/kg
Density: 0.84 kg/dm³
Viscosity: 3.0 cSt at 40°C

If the fuel properties deviates from these values, correction factors in % are found in the graphs below. The correction factors can then be applied in 'Calculation of engine output', which you will find on a page later on.

Effect of fuel density on engine output:



Effect of fuel viscosity on engine output:





Output corrections due to air properties

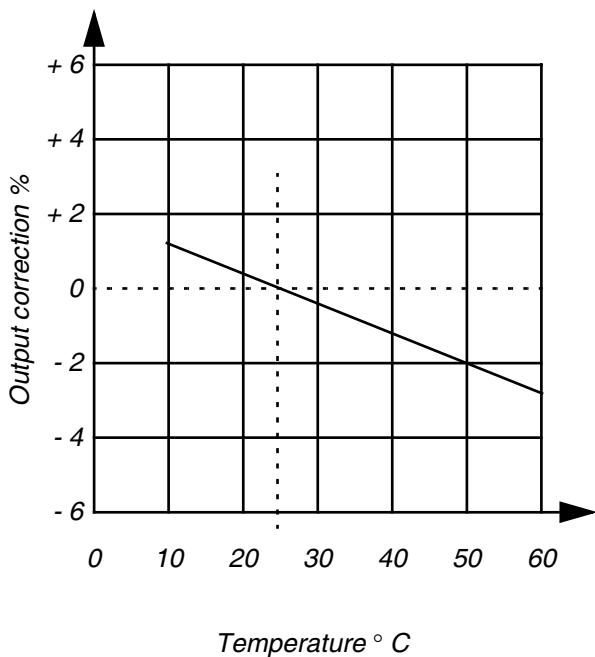
Sold output presupposes the following air properties (as per ISO 3046):

Air temperature: 25°C

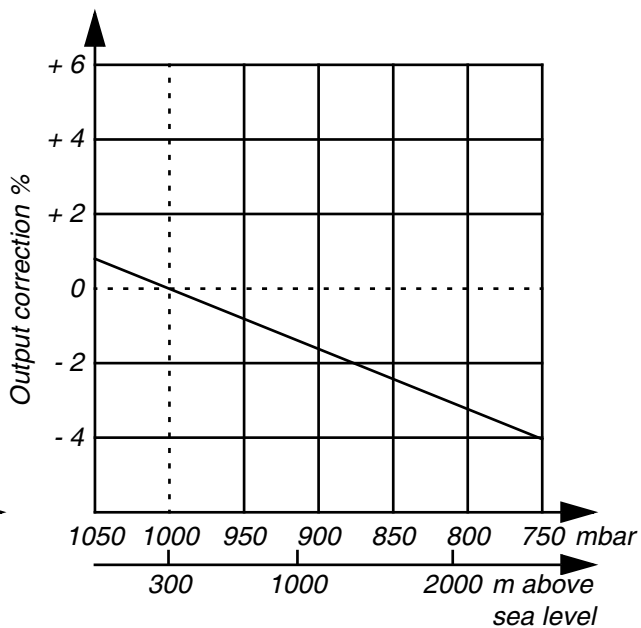
Air pressure: 1000 mbar

If the air properties deviate from these values, correction factors in % are found in the graphs below. The correction factors can then be applied in 'Calculation of engine output', which you will find on a page later on.

Effect of intake air temperature on engine output:



Effect of air pressure on engine output:



**Output losses in driven equipment**

When calculating the power losses, all equipment driven by the engine must be considered. For example:

Sea-water pump

Included in output

Compressor

Maximum power demand for Scania 2-cylinder air compressor ~4 kW.

Alternator

Maximum power demand for Scania alternators (alternator efficiency ~40%):

100A = **6** kW

Transmission

For efficiency/losses in transmission or gears, contact the manufacturer.

Power take-off

For equipment driven by power take-offs, contact the manufacturer.



This form can be used in order to check if sold output will be sufficient for the installation in question.

Engine type:		Sold output:	kW
<u>Corrections due to:</u>			↓
Fuel density	%		
Fuel viscosity	%		
Air properties	%		
Total correction	= %	Sold output: →	kW
		Engine output:	= kW
			↓
<u>Other output losses:</u>		Engine output:	kW
Driven equipment (alternator, PTO etc.)			+ kW
		Net engine output:	= kW
		Calculated power losses in engine (Total correction + Driven equipment)	= kW

Engine type:	DI13 075M	Sold output:	376	kW
<u>Corrections due to:</u>				
Fuel density	0	% (0.83 kg/dm ³)		↓
Fuel viscosity	0	% (3cSt)		
Air properties	-1	% (35°C, 1000 mbar)		
Total correction	= -1	%		
		----->	Sold output:	
			+	
			376	kW
			-4	kW
			= 372	kW
				↓
			Engine output:	
			+	
			372	kW
			-3	kW
			= 369	kW
			Net engine output:	
			= 7	kW
			Calculated power losses in engine	
			= 7	kW
			(Total correction + Driven equipment)	



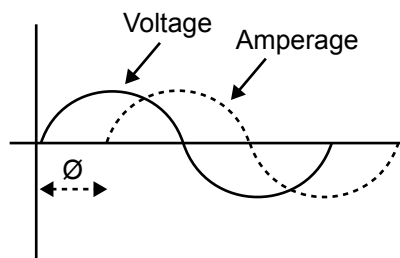
Generator output

A genset delivers electric power, usually expressed in kVA. The periodicity is most often 50 or 60 Hz corresponding to 1500 and 1800 rpm engine speed respectively.

The genset output has to be re-calculated to obtain 'sold output' required. When calculating, the output factor for the electric load, $\cos \varnothing$, and losses in generator has to be included. On the following pages there are formulas (with examples) for calculating 'sold output required' from 'electrical output' and vice versa.

Reactive and active output

In an AC generator both active and reactive output is generated depending on the type of load (usually electric motors, lighting or heating). In electric motors a counter-voltage is induced. This prevents the current from increasing in pace with the voltage and results in a phase (time) delay between maximum values of current and voltage. See figure. With a phase delay of 90° between voltage and current the result is zero. This means that the engine is loaded only with the losses in the generator and the lines to the output user.



The power caused by the phase delayed current is called 'reactive output', VAr. With less phase delay than 90° an 'active output' is obtained. As the phase delay normally is less than 45° , the 'active output' is larger than the reactive. The vector sum of 'reactive' and 'active output' is called 'apparent output', VA or kVA (1000 VA). How large the part of the load that is 'active output' depends on the type of load. This can be calculated with the formula:

$$P = S \times \cos \varnothing$$

where: P = active output, kVAa (kWe)

S = apparent output, kVA

$\varnothing$ = output factor (phase delay)

The output factor in operation of electric motors and lighting is normally assumed to be 0.8. It may exceed 0.8 if the load is mainly resistive, e.g. lighting or electric heating.

The maximum output of a complete genset is normally specified in kVA with output factor 0.8.

The required 'sold output' is determined by the active output plus the losses in the generator. This can be calculated with the formula:

$$P_e = P \times 1 / \eta$$

where: P_e = engine net output, kW

P = active output, kVA, of the generator

η = generator efficiency

Note! In above, no output losses due to fuel and air properties etc. are included. Such losses must be regarded when making a complete calculation.



Calculation of electrical power

To verify that the 'sold output' will be sufficient for the installation in question, you can calculate the electrical power. You can convert the sold output in kW to kWe or kVA by means of the following formulas:

$$\text{kWm} \times \eta = \text{kWe}$$

$$\frac{\text{kWm} \times \eta}{\cos\phi} = \text{kVA}$$

kWm	=	net engine output, i.e. sold output - power losses (due to fuel and air properties, driven equipment etc.) according to the 'Calculation of engine output'
η	=	generator efficiency degree, expressed as decimal number
$\cos\phi$	=	0.8 (phase delay or output factor)

The following limit values are used for the generator efficiency percentage when calculating kVA:

<300 kVA = 92% (0.92)

>300 - <500 kVA = 93% (0.93)

>500 kVA = 94% (0.94)

Example:

Sold output: 400 kW

Total power loss: 22 kW --->

kWm = 400 - 22 = 378

Generator efficiency (η): 93%

Output factor ($\cos\phi$): 0.8

$$378 \times 0.93 = 352 \text{ kWe}$$

$$\frac{378 \times 0.93}{0.8} = 439 \text{ kVA}$$



Calculation of required engine output

To calculate what engine output is required to obtain a certain electrical output you can use the formulas below. The formulas are based on the same formulas used for calculating electrical power.

$$\frac{kWe}{\eta} = kWm$$

$$\frac{kVA \times \cos\phi}{\eta} = kWm$$

- kWm = net engine output, i.e. sold output - power losses (due to fuel and air properties, driven equipment etc.) according to the 'Calculation of engine output'.
 η = generator efficiency degree, expressed as decimal number
 $\cos\phi$ = 0.8 (phase delay or output factor)

Example:

As an example we need to obtain 352 kWe or, if expressed in kVA, 439 kVA. The generator efficiency (η) is 93% and the output factor ($\cos\phi$) is 0.8. Calculated power loss is 22 kW.

$$\frac{352}{0.93} = 378 \text{ kWm}$$

$$\frac{439 \times 0.8}{0.93} = 378 \text{ kWm}$$

Since kWm = sold output - power losses, the required engine output (sold output) is received after adding the calculated power loss to kWm, i.e. $378 + 22 = 400 \text{ kW}$.



Step loads

Applies to engines for auxiliary power only

For engine step load capability, we refer to ISO 8528-5: 'Reciprocating internal combustion engine driven alternating current generating sets - Part 5: Generating sets'

In ISO 8528-5 it is stated that step load capability depends on many different factors, e.g. design of turbocharging system, brake mean effective pressure at rated power and governor behaviour are factors where Scania have influence. Other factors, e.g. generator design, excitation system characteristics, voltage regulator behaviour and rotational inertia of the whole generating set are the responsibility of the genset manufacturer.

The graph below is an excerpt from ISO8528-5, showing 'Guide values for maximum possible sudden power increases as a function of brake mean effective pressure, P_{me} , at declared power'. If the generator fulfils the factors mentioned above in best possible way, the Scania engine, at normal operating temperature and normal ambient conditions, will provide step load capability in the range between curves 'Second' and 'Third power stage'

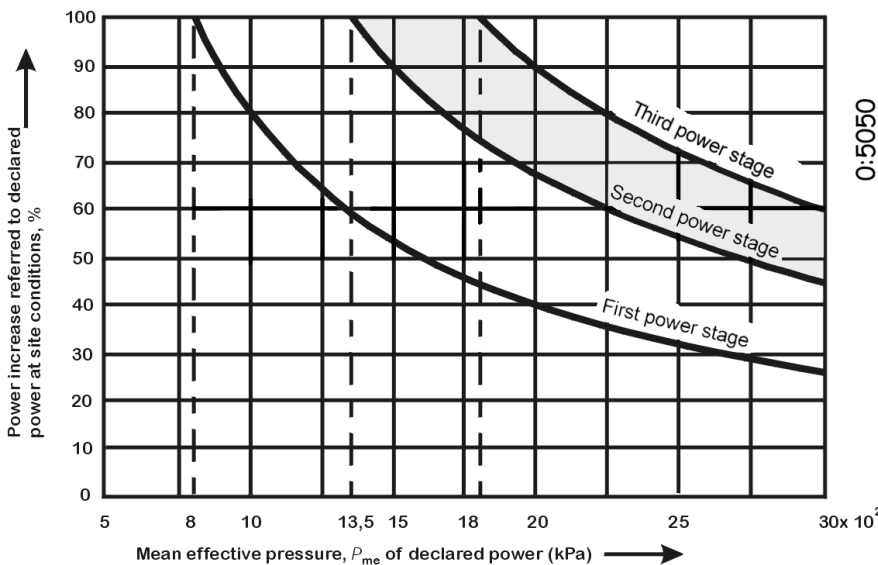


Figure 6 - Guide values for maximum possible sudden power increase as a function of brake mean effective pressure, P_{me} at declared power (four-stroke engines)

Formula for calculation of P_{me} : $P_{me} (bar) = K \times Ne / n$

K = Conversion factor, see below

Ne = rated power in kW

n = rated speed in r/min

9-series engine: K = 129.0

13-series engine: K = 94.5

16-series engine: K = 73.1



Dimensions on sketches

For all dimensions in sketches the following applies:

- All dimensions are indicated in mm, unless something else is mentioned.
- The sketches show the dimensions at the time of printing.
- The sketches are intended only as general sales information.
- Dimensions are subject to changes from time to time and for that reason the sketches must not be used for any installation purposes.
- Before dimensioning any installation, the latest issue of the drawing must be ordered from Scania.
- Scania will not take any responsibility for dimensioning made without consulting the correct drawing.

All drawings mentioned in the Data Handbook can be delivered with short notice and will be sent free of charge.



Conversion factors

The list is based on SI units (European standard) with conversion factors to most frequently used units in other parts of the world. We have tried to limit the conversion factors to max 5 significant digits and in certain cases the factor is replaced with ‘-’ because the large amount of digits makes the factor useless in calculations.

Length (1 m = 1 000 mm)

m	in	ft	yd
1	39.370	3.2808	1.0936
0.0254	1	0.08333	0.02778
0.3048	12	1	0.33333
0.9144	36	3	1

Area (1 m² = 1 000 000 mm²)

m ²	in ²	ft ²	yd ²
1	1 550	10.764	1.1960
0.00065	1	0.00694	0.00077
0.0929	144	1	0.11111
0.83613	1 296	9	1

Volume (1 dm³ = 1 000 cm³ = 1 000 000 mm³)

m ³	dm ³ , l (litre)	in ³	ft ³	US gallon
1	1 000	61 024	35.315	264.17
0.001	1	61.024	0.03532	0.26417
-	0.01639	1	0.00058	0.00433
0.02832	28.317	1 728	1	7.4805
0.004546	4.546	277.420	0.16054	1.2010
0.003785	3.785	231	0.13368	1

Mass (1 kg = 1 000 g)

kg	lb (pound)	oz (ounce)
1	2.2046	35.274
0.45359	1	16
0.02835	0.0625	1
14.5939	32.174	514.78
1 016	2 240	35 840
907.18	2 000	32 000

Power (1 kW = 1 000 W)

kW, kNm/s, kJ/s	hp, metric* hk	hp, US
1	1.3596	1.3410
0.7355	1	0.98632
0.7457	1.0139	1
0.00136	0.00184	0.00182

* **Note!** All hp figures stated in the Data Handbook are metric.



Energy, Work (1 kW = 1 000 W)

kWs, kJ, kNm	kWh	kpm	hkh (metric hph)	ft x lbf (foot pound-force)
1	0.00028	101.97	0.00038	737.56
3 600	1	367 100	1.3596	2 655 200
0.00981	-	1	-	7.2330
2 631.6	0.7355	270 000	1	1 952 910
0.00136	-	0.13826	-	1

Torque

Nm	kpm	lbf x in	lbf x ft
1	0.10197	8.8508	0.73756
9.8067	1	86.796	7.2330
0.11299	0.011521	1	0.08333
1.3558	0.13826	12	1

Pressure, Stress

N/m ² , Pa	bar (= 1000 mbar)	mm Hg	kp/cm ²	kp/mm ²	psi, lbf/in ²	mm Wc
1	0.00001	0.0075	-	-	-	0.1
100 000	1	750.062	1.0197	0.01097	14.503	10 000
133.32	0.00133	1	0.00136	-	0.01934	13.332
98 066	0.98066	735.56	1	0.010	14.223	9 806.6
9 806 650	98.066	73 556	100	1	1 422.3	980 665
6 894.76	0.06895	51.715	0.07031	-	1	689.476
10	0.0001	0.07501	-	-	0.00145	1

Density

kg/dm ³	g/mm ³	lb/in ³	lb/ft ³
1	0.001	0.03613	0.06243
1 000	1	36.1273	62.428
27.679	0.02768	1	1 728
0.01602	-	0.00058	1

Temperature

°C	°F
100	212
38	100
Formula: (1.8 x C) + 32 = F	Formula: (F-32) x 0.5556 = C



EC Machinery Directives

Applicable to the European Community, EC

To declare Scania's incorporation with the EC Machinery Directive, the sign below is attached to all engines delivered from Scania.

The Scania engine is, as stated on the sign, supplied as a component and must not be operated until installed and equipped with proper covers and protection for the drive belts, fan, couplings etc. in accordance with EC Machinery directive 2006/42 EC.

2**SCANIA**
Scania Engines

DECLARATION OF INCORPORATION IN ACCORDANCE WITH EC DIRECTIVE 2006/42 EC

This engine, manufactured by Scania, is
supplied solely as a component to be
incorporated into a machine.

This engine must not be operated until it has
been incorporated into relevant CE marked
machinery which is itself declared to be in
conformity with above directive.

Robert Sobocki
Director, Scania Engines
Södertälje, 15 July 2009

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Scania CV AB, S-151 87 Södertälje, Sweden



3 | ENGINE PROGRAMME 9-, 13- and 16-series

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3_A



Engine programme

All engines are listed with their intended emission compliance. Engine compliance implies that the engine fulfils the emission regulation level, however this does not mean that the engine is approved and certified. For detailed information about approved and certified engines, access SAIL at <http://sail.scania.com> to view or download the appropriate certificate.

With heat exchanger

Engine type	Engine ref.	ICFN Continuous service			IFN Intermittent service			Patrol craft long			Patrol craft short			Emission compliance		
		kW	hp	rpm	kW	hp	rpm	kW	hp	rpm	kW	hp	rpm	IMO Tier	US Tier	EU stage
DI09 070M	03-01	162	220	1800	-	-	-	-	-	-	-	-	-	II		IIIA
DI09 070M	03-02	184	250	1800	-	-	-	-	-	-	-	-	-	II		IIIA
DI09 070M	03-03	221	300	1800	-	-	-	-	-	-	-	-	-	II		IIIA
DI09 070M	03-04	257	350	1800	-	-	-	-	-	-	-	-	-	II		IIIA
DI09 072M	03-21	-	-	-	221	300	2100	-	-	-	-	-	-	II		IIIA
DI09 072M	03-22	-	-	-	257	350	2100	-	-	-	-	-	-	II		IIIA
DI09 072M	03-23	-	-	-	294	400	2100	-	-	-	-	-	-	II		IIIA
DI13 070M	03-01	294	400	1800	-	-	-	-	-	-	-	-	-	II	2	IIIA
DI13 070M	03-02	331	450	1800	-	-	-	-	-	-	-	-	-	II	2	IIIA
DI13 070M	03-03	368	500	1800	-	-	-	-	-	-	-	-	-	II	2	IIIA
DI13 070M	03-04	405	550	1800	-	-	-	-	-	-	-	-	-	II	2	IIIA
DI13 078M	03-51	-	-	-	331	450	2100	-	-	-	-	-	-	II	2	IIIA
DI13 078M	03-52	-	-	-	368	500	2100	-	-	-	-	-	-	II	2	IIIA
DI13 078M	03-53	-	-	-	405	550	2100	-	-	-	-	-	-	II	2	IIIA
DI13 072M	03-21	-	-	-	441	600	2300	-	-	-	-	-	-	II	2	IIIA
DI13 072M	03-22	-	-	-	-	-	-	478	650	2300	-	-	-	II	2	IIIA
DI13 077M	03-41	-	-	-	-	-	-	515	700	2300	-	-	-	II	2	IIIA
DI13 077M	03-42	-	-	-	-	-	-	-	-	-	551	750	2300	II	2	IIIA

Note! All hp figures in the Data Handbook are metric.



With heat exchanger

Engine type	Engine ref.	ICFN Continuous service			IFN Intermittent service			Patrol craft long			Patrol craft short			Emission compliance		
		kW	hp	rpm	kW	hp	rpm	kW	hp	rpm	kW	hp	rpm	IMO Tier	US Tier	EU stage
DI16 070M	03-01	405	550	1800	-	-	-	-	-	-	-	-	-	II	2	IIIA
DI16 070M	03-02	460	625	1800	-	-	-	-	-	-	-	-	-	II	2	IIIA
DI16 070M	03-03	515	700	1800	-	-	-	-	-	-	-	-	-	II	2	IIIA
DI16 070M	03-04	552	750	1800	-	-	-	-	-	-	-	-	-	II	2	IIIA
DI16 072M	03-25	-	-	-	-	-	-	588	800	2300	-	-	-	II	2	IIIA
DI16 072M	03-26	-	-	-	-	-	-	625	850	2300	-	-	-	II	2	IIIA
DI16 072M	03-27	-	-	-	-	-	-	-	-	-	662	900	2300	II	2	IIIA
DI16 077M*	03-41	-	-	-	-	-	-	662	900	2300	-	-	-	II	2	IIIA
DI16 077M*	03-42	-	-	-	-	-	-	-	-	-	736	1000	2300	II	2	IIIA
DI16 072M	03-21	-	-	-	478	650	2100	-	-	-	-	-	-	II		IIIA
DI16 072M	03-22	-	-	-	515	700	2100	-	-	-	-	-	-	II		IIIA
DI16 072M	03-23	-	-	-	552	750	2100	-	-	-	-	-	-	II		IIIA
DI16 072M	03-24	-	-	-	588	800	2100	-	-	-	-	-	-	II		IIIA

*) Note! Optimized for Water Jet applications. Not intended for conventional propeller use.

Note! All hp figures in the Data Handbook are metric.



With keel cooling

Engine type	Engine ref.	ICFN Continuous service			IFN Intermittent service			Patrol craft long			Patrol craft short			Emission compliance		
		kW	hp	rpm	kW	hp	rpm	kW	hp	rpm	kW	hp	rpm	IMO Tier	US Tier	EU stage
DI09 070M	03-11	162	220	1800	-	-	-	-	-	-	-	-	-	II		IIIA
DI09 070M	03-12	184	250	1800	-	-	-	-	-	-	-	-	-	II		IIIA
DI09 070M	03-13	221	300	1800	-	-	-	-	-	-	-	-	-	II		IIIA
DI09 070M	03-14	257	350	1800	-	-	-	-	-	-	-	-	-	II		IIIA
DI09 072M	03-31	-	-	-	221	300	2100	-	-	-	-	-	-	II		IIIA
DI09 072M	03-32	-	-	-	257	350	2100	-	-	-	-	-	-	II		IIIA
DI09 072M	03-33	-	-	-	294	400	2100	-	-	-	-	-	-	II		IIIA
DI13 071M	03-11	294	400	1800	-	-	-	-	-	-	-	-	-	II	2	IIIA
DI13 071M	03-12	331	450	1800	-	-	-	-	-	-	-	-	-	II	2	IIIA
DI13 071M	03-13	368	500	1800	-	-	-	-	-	-	-	-	-	II	2	IIIA
DI13 073M	03-31	-	-	-	331	450	2100	-	-	-	-	-	-	II	2	IIIA
DI13 073M	03-32	-	-	-	368	500	2100	-	-	-	-	-	-	II	2	IIIA
DI13 073M	03-33	-	-	-	405	550	2100	-	-	-	-	-	-	II	2	IIIA
DI16 071M	03-11	405	550	1800	-	-	-	-	-	-	-	-	-	II	2	IIIA
DI16 071M	03-12	460	625	1800	-	-	-	-	-	-	-	-	-	II	2	IIIA
DI16 073M	03-31	-	-	-	478	650	2100	-	-	-	-	-	-	II		IIIA
DI16 073M	03-32	-	-	-	515	700	2100	-	-	-	-	-	-	II		IIIA
DI16 073M	03-33	-	-	-	552	750	2100	-	-	-	-	-	-	II		IIIA
DI16 073M	03-34	-	-	-	588	800	2100	-	-	-	-	-	-	II		IIIA
DI16 079M	03-51	405	550	1800	-	-	-	-	-	-	-	-	-	II		IIIA
DI16 079M	03-52	460	625	1800	-	-	-	-	-	-	-	-	-	II		IIIA
DI16 079M	03-53	515	700	1800	-	-	-	-	-	-	-	-	-	II		IIIA
DI16 079M	03-54	552	750	1800	-	-	-	-	-	-	-	-	-	II		IIIA

Note! All hp figures in the Data Handbook are metric.



Emission regulations

	NO _x (g/kWh)	HC (g/kWh)	NO _x +HC (g/kWh)	PM (g/kWh)	CO (g/kWh)	Segment	Region
IMO Tier I	NO _x : 10.4-9.8 (1500-2000 rpm), NO _x : 9.8 (>2000 rpm)					Marine	International
IMO Tier II	NO _x : 8.2-7.7 (1500-2000 rpm)					Marine	International
IMO Tier III*	NO _x : 2.0					Marine	International
Stage IIIA Inland Waterway Vessels	-	-	7.2	0.2	5.0	Marine propulsion	Europe
CCNR II	6.0	1.0	-	0.2	-	Marine River Rhine	Europe
Tier 2	-	-	7.2	0.2	5.0	Marine Commercial	USA
Tier 2	-	-	7.2	0.2	-	Marine Recreational	USA
Tier 3 (≤35 kW/l)	-	-	5.6	0.11	-	Marine Commercial	USA
Tier 3 (>35 kW/l)	-	-	5.8	0.12	-	Marine Commercial	USA
Tier 3	-	-	5.8	0.12	-	Marine Recreational	USA

*Will be valid in NO_x ECA (Emission Control Areas). For other areas IMO Tier II will continue.

Emission time schedule

	2010	2011	2012	2013	2014	2015	2016
INTERNATIONAL	IMO Tier I	IMO Tier II					IMO Tier III*
EUROPE	Stage IIIA Inland Waterway Vessels					Not decided	
	CCNR II						
USA	Tier 2 Commercial				Tier 3 Marine		
	Tier 2 Recreational				Tier 3 Marine Recreational		

Note that the Emission time schedule only should be seen as an indication of emission regulations and might have been changed since the latest update.



Classification compliance

Below is a list of available classification societies. For detailed information about approved and certified engines, access SAIL at <http://sail.scania.com> to view or download the appropriate certificate.

ABS: American Bureau of Shipping

BV: Bureau Veritas

CCS: China Classification Society

CRS: Croatia Register of Shipping

DNV: Det Norske Veritas

GL: Germanischer Lloyd

LR: Lloyds Register of Shipping

Rina: Registro Italiano Navale

RRR: Russian River Register

RS: Russian Maritime Register of Shipping

SF: Sjöfartsverket (Swedish Maritime Administration)

TL: Türk Loydu



3 | ENGINE PROGRAMME 9-, 13- and 16-series

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Engine programme

All engines are listed with their intended emission compliance and classification type approval. Engine compliance implies that the engine fulfils the emission regulation level, however this does not mean that the engine is approved and certified.

For detailed information about approved and certified engines access SAIL at <http://sail.scania.com> to view or download the appropriate certificate.

With heat exchanger

Engine type	Engine ref.	1500 rpm (50 Hz)	1800 rpm (60 Hz)	Emission compliance		
		PRP	PRP			
		kW	kW	IMO Tier	EU Stage	US Tier
DI09 074M	04-01	199	199	II	IIIA ¹⁾	
DI09 074M	04-02	217	217	II	IIIA ¹⁾	
DI09 074M	04-03	269	269	II	IIIA ¹⁾	
DI09 074M	04-04	269	323	II	IIIA ¹⁾	
DI13 074M	04-01	323	376	II	IIIA ¹⁾	2
DI13 074M	04-02	376	426	II	IIIA ¹⁾	2
DI13 074M	04-03	426	426	II	IIIA ¹⁾	2
DI16 074M	04-01	430	468	II	IIIA ¹⁾	2
DI16 074M	04-02	450	511	II	IIIA ¹⁾	2
DI16 074M	04-03	480	553	II	IIIA ¹⁾	2
DI16 074M	04-04	511	596	II	IIIA ¹⁾	2

With keel cooling

Engine type	Engine ref.	1500 rpm (50 Hz)	1800 rpm (60 Hz)	Emission compliance		
		PRP	PRP			
		kW	kW	IMO Tier	EU Stage	US Tier
DI09 074M	04-11	199	199	II	IIIA ¹⁾	
DI09 074M	04-12	217	217	II	IIIA ¹⁾	
DI09 074M	04-13	269	269	II	IIIA ¹⁾	
DI09 074M	04-14	269	323	II	IIIA ¹⁾	
DI13 075M	04-11	323	376	II	IIIA ¹⁾	2
DI13 075M	04-12	376	426	II	IIIA ¹⁾	2
DI13 075M	04-13	426	426	II	IIIA ¹⁾	2
DI16 075M	04-11	430	468	II	IIIA ¹⁾	-
DI16 075M	04-12	450	511	II	IIIA ¹⁾	-
DI16 075M	04-13	480	553	II	IIIA ¹⁾	-
DI16 075M	04-14	511	596	II	IIIA ¹⁾	-

1) EU Stage IIIA only applies for propulsion engines with E2 test cycle.



Emission regulations

	NO _x (g/kWh)	HC (g/kWh)	NO _x +HC (g/kWh)	PM (g/kWh)	CO (g/kWh)	Segment	Region
IMO Tier I	NO _x : 10.4-9.8 (1500-2000 rpm), NO _x : 9.8 (>2000 rpm)					Marine	International
IMO Tier II	NO _x : 8.2-7.7 (1500-2000 rpm)					Marine	International
IMO Tier III*	NO _x : 2.0					Marine	International
Stage IIIA Inland Waterway Vessels	-	-	7.2	0.2	5.0	Marine propulsion	Europe
CCNR II	6.0	1.0	-	0.2	-	Marine River Rhine	Europe
Tier 2	-	-	7.2	0.2	5.0	Marine Commercial	USA
Tier 2	-	-	7.2	0.2	-	Marine Recreational	USA
Tier 3 (≤35 kW/l)	-	-	5.6	0.11	-	Marine Commercial	USA
Tier 3 (>35 kW/l)	-	-	5.8	0.12	-	Marine Commercial	USA
Tier 3	-	-	5.8	0.12	-	Marine Recreational	USA

*Will be valid in NO_x ECA (Emission Control Areas), for other areas IMO Tier II will continue.

Emission time schedule

	2010	2011	2012	2013	2014	2015	2016
INTERNATIONAL	IMO Tier I	IMO Tier II					IMO Tier III*
EUROPE	Stage IIIA Inland Waterway Vessels					Not decided	
	CCNR II						
USA	Tier 2 Commercial				Tier 3 Marine		
	Tier 2 Recreational				Tier 3 Marine Recreational		

Note that the Emission time schedule only should be seen as an indication of emission regulations and might have been changed since the latest update.



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CRS: Croatia Register of Shipping

DNV: Det Norske Veritas

GL: Germanischer Lloyd

LR: Lloyds Register of Shipping

Rina: Registro Italiano Navale

RRR: Russian River Register

RS: Russian Maritime Register of Shipping

SF: Sjöfartsverket (Swedish Maritime Administration)

TL: Türk Loydu



4 ENGINE DATA

9-series

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General information

Standard equipment

Scania Engine Management System, EMS

Unit injectors, PDE

Turbocharger

Water-cooled charge air cooler

Fuel pre-filter with water separator

Fuel filter

Oil filter, full flow

Centrifugal oil cleaner

Oil cooler, integrated in block

Oil filler, in engine block

Oil draining with plug

Oil dipstick, in block

Starter, 2-pole, 7.0 kW, (EMS controlled)

Alternator 2-pole, 100A

Flywheel SAE 14

Silumin flywheel housing, SAE1 flange

Front-mounted engine brackets

Protection covers

Sea water pump (engines with heat exchanger only)

Heat exchanger with expansion tank (engines with heat exchanger only)

Closed crankcase ventilation

Operator's manual

For optional equipment, see 'Equipment list'.

Note! No optional equipment is type approved for classification if not otherwise stated.

Ratings

ICFN, Continuous service

Rated power available 1 h/1 h.

Unlimited h/year service time at a total load factor of 100%.

IFN, Intermittent service

Intended for intermittent use where rated power is available 1 hour/3 hours period.

Accumulated load factor must not exceed 80% of rated power.

Unlimited h/year service time.

Emission compliance and classification

For detailed information about approved and certified engines and classification society approvals, access SAIL at <http://sail.scania.com> to view or download the appropriate certificate.



Engine programme

EU Stage IIIA and IMO Tier II compliant engines

Preliminary start of engine deliveries: September 2013

With heat exchanger

Engine type	ICFN 1800 rpm		IFN 2100 rpm		Factory order reference sequence			
	kW	hp	kW	hp	Rating	Engine speed	Output	Engine ref.
DI09 070M	162	220	-	-	13-01	35-02	12-75	03-01
DI09 070M	184	250	-	-	13-01	35-02	12-69	03-02
DI09 070M	221	300	-	-	13-01	35-02	12-70	03-03
DI09 070M	257	350	-	-	13-01	35-02	12-04	03-04
DI09 072M	-	-	221	300	13-02	35-04	12-70	03-21
DI09 072M	-	-	257	350	13-02	35-04	12-04	03-22
DI09 072M	-	-	294	400	13-02	35-04	12-06	03-23

4_A

With keel cooling

Engine type	ICFN 1800 rpm		IFN 2100 rpm		Factory order reference sequence			
	kW	hp	kW	hp	Rating	Engine speed	Output	Engine ref.
DI09 070M	162	220	-	-	13-01	35-02	12-75	03-11
DI09 070M	184	250	-	-	13-01	35-02	12-69	03-12
DI09 070M	221	300	-	-	13-01	35-02	12-70	03-13
DI09 070M	257	350	-	-	13-01	35-02	12-04	03-14
DI09 072M	-	-	221	300	13-02	35-04	12-70	03-31
DI09 072M	-	-	257	350	13-02	35-04	12-04	03-32
DI09 072M	-	-	294	400	13-02	35-04	12-06	03-33



Basic data

General

Configuration and number of cylinders	5 in-line	
Working principle	4-stroke	
Bore x stroke	130 x 140	mm
Displacement	9.3	dm ³
Compression ratio	18:1	
Firing order	1 - 2 - 4 - 5 - 3	
Piston speed		
at 1500 rpm	7.0	m/s
at 1800 rpm	8.4	m/s
Pistons	Aluminum pistons	
Camshaft	High position alloy steel	
Connection rods	I-section press forgings of alloy steel	
Crankshaft	Alloy steel with hardened and polished bearing surfaces	
Rotation, seen from flywheel end	Counter clockwise	
Total moment of inertia with flywheel		
SAE 14	2.63	kgm ²
Number of teeth on flywheel ring gear	158	
Weight approx. (excl. oil and coolant)		
with heat exchanger	1150	kg
with keel cooling	1044	kg

Lubrication system

Oil capacity (standard oil sump)		
min	32	dm ³
max	38	dm ³
Oil consumption	<0.2	g/kWh
Oil change intervals	500	h
Oil grade		
engines run on low-sulphur fuel	ACEA E5 or E7	
engines not run on low-sulphur fuel	Total Base Number (TBN) at least 12 (ASTM 2896)	
Oil pressure		
normal	3-6	bar
minimum permitted at idle speed	0.7	bar
Oil temperature		
normal	90-110	°C
Oil cleaner	Centrifugal	
filtration	5-7	Micron
Oil filter	Paper/Full flow	
Oil cooler	Water cooled/Full flow	

Injection system

Type	Unit injectors
Governor	Scania Engine Management System, EMS
Fuel filter	Paper filter element

**Cooling system**

Coolant volume

with heat exchanger	30	dm ³
with keel cooling	23	dm ³

Coolant temperature

with heat exchanger	90-95	°C
with keel cooling	83-88	°C

Number of thermostats..... 1

Opening temperature

with heat exchanger	80/87	°C
with keel cooling	75	°C

Intake system

Permissible pressure drop in intake system

with cleaned or new filter.....30

Permissible pressure drop in intake system

with blocked (dirty) filter65

mbar

mbar

Electrical system

Type2-pole, 24V, DC

Starter, standard equipment.....2-pole, 24V, 7.0 kW

Alternator, standard equipment 2-pole, 28V, 100A

4_A



Technical data

DI09 070M, 162 kW / 220 hp - With heat exchanger (engine ref. 03-01)

DI09 070M, 162 kW / 220 hp - With keel cooling (engine ref. 03-11)

Emission compliance	Fuel injection system	Rating
EU Stage IIIA and IMO Tier II	PDE	ICFN, Continuous service

	Engine speed (rpm)					Unit
	1200	1300	1500	1700	1800	
Gross power						
Full load curve	162	162	162	162	162	kW
	220	220	220	220	220	hp
Propeller curve (assumed exponent 2.5)	59	72	103	140	162	kW
	80	98	140	191	220	hp
Gross torque	1289	1190	1031	910	859	Nm
Spec. fuel consumption						
full load	203	196	195	198	204	g/kWh
3/4 load	204	198	200	204	212	g/kWh
1/2 load	212	205	211	219	230	g/kWh
Propeller curve (assumed exponent 2.5)	15	18	25	34	39	l/h
Heat rejection						
to coolant*	123	117	117	123	130	kW
to main coolant circuit**	108	102	99	101	104	kW
to charge air cooler circuit**	15	15	18	22	26	kW
to exhaust gas	103	95	93	93	97	kW
to surrounding air	8	8	8	8	8	kW
Coolant flow @ back pressure in water circuit for charge air cooler**	167 @0.25	181 @0.28	208 @0.36	236 @0.46	250 @0.50	dm ³ @bar
Max. water inlet temp. to charge air cooler**	38	38	38	38	38	°C
Air consumption	12	12	15	17	18	kg/min
Air temperature						
before charge air cooler**	117	112	113	118	124	°C
after charge air cooler**	39	39	39	39	39	°C
Pressure in intake manifold	1.0	1.0	1.0	1.0	1.1	Bar
Exhaust flow	12	13	15	17	19	kg/min
Exhaust temperature	481	431	373	332	321	°C

* For engines with heat exchanger

** For engines with keel cooling

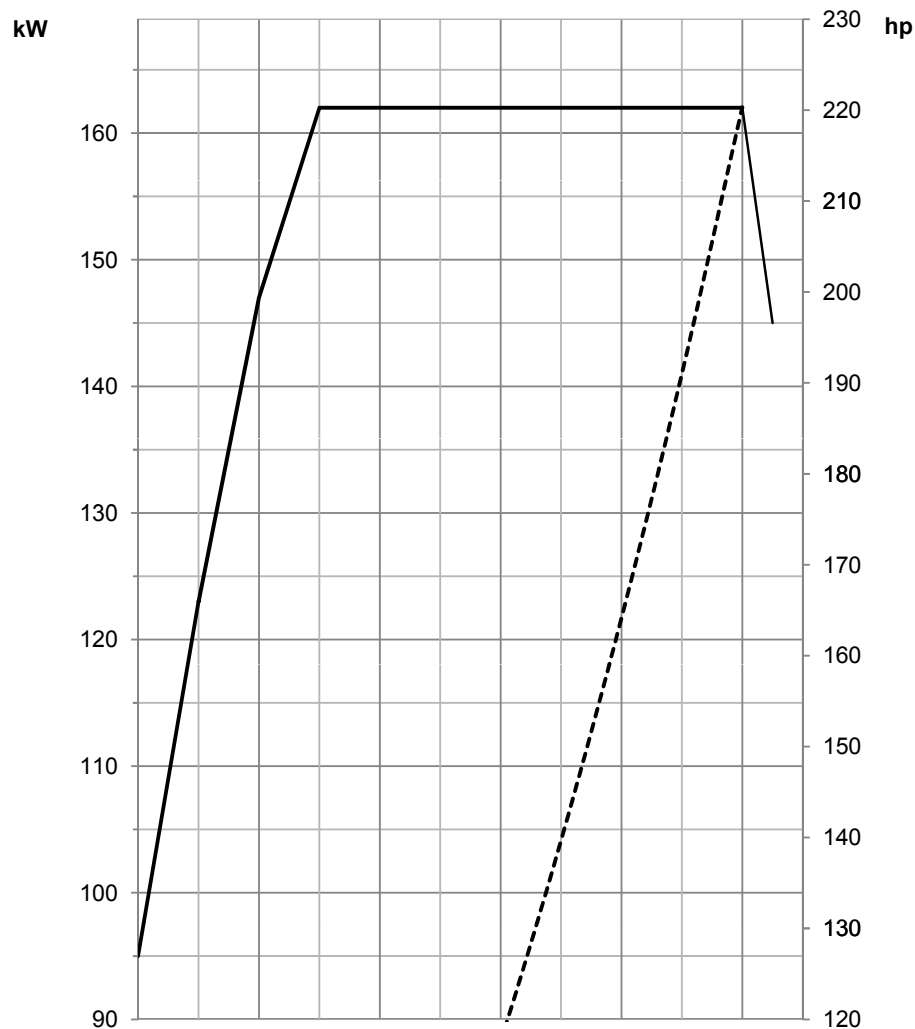


DI09 070M, 162 kW / 220 hp - With heat exchanger (engine ref. 03-01)

DI09 070M, 162 kW / 220 hp - With keel cooling (engine ref. 03-11)

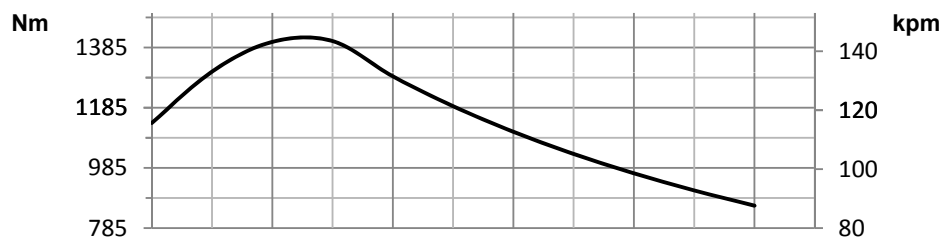
Power

(kW x 1.36 = hp)



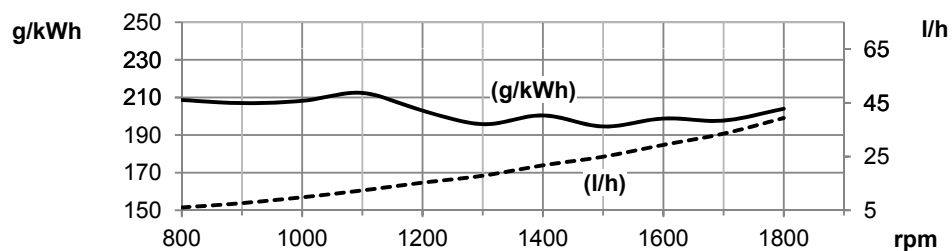
Torque

(Nm / 9.81 = kpm)



Spec. fuel consumption

(g/kWh / 1.36 = g/hph)



----- Propeller curve, assumed exponent 2.5
— Full load curve



Technical data

DI09 070M, 184 kW / 250 hp - With heat exchanger (engine ref. 03-02)

DI09 070M, 184 kW / 250 hp - With keel cooling (engine ref. 03-12)

Emission compliance	Fuel injection system	Rating
EU Stage IIIA and IMO Tier II	PDE	ICFN, Continuous service

	Engine speed (rpm)					Unit
	1200	1300	1500	1700	1800	
Gross power						
Full load curve	177	184	184	184	184	kW
	241	250	250	250	250	hp
Propeller curve (assumed exponent 2.5)	67	82	117	159	184	kW
	91	111	159	217	250	hp
Gross torque	1409	1352	1171	1034	976	Nm
Spec. fuel consumption						
full load	203	196	193	196	202	g/kWh
3/4 load	203	197	197	201	207	g/kWh
1/2 load	210	203	207	214	224	g/kWh
Propeller curve (assumed exponent 2.5)	17	20	28	38	44	l/h
Heat rejection						
to coolant*	135	133	131	137	144	kW
to main coolant circuit**	117	114	109	111	113	kW
to charge air cooler circuit**	18	19	22	26	31	kW
to exhaust gas	112	108	105	105	110	kW
to surrounding air	9	9	8	9	9	kW
Coolant flow @ back pressure in water circuit for charge air cooler**	167 @0.25	181 @0.28	208 @0.36	236 @0.46	250 @0.50	dm ³ @bar
Max. water inlet temp. to charge air cooler**	38	38	38	38	38	°C
Air consumption	12	14	16	18	20	kg/min
Air temperature						
before charge air cooler**	126	125	124	127	134	°C
after charge air cooler**	39	39	39	39	40	°C
Pressure in intake manifold	1.1	1.1	1.1	1.2	1.2	Bar
Exhaust flow	13	14	16	18	20	kg/min
Exhaust temperature	492	446	384	347	335	°C

* For engines with heat exchanger

** For engines with keel cooling

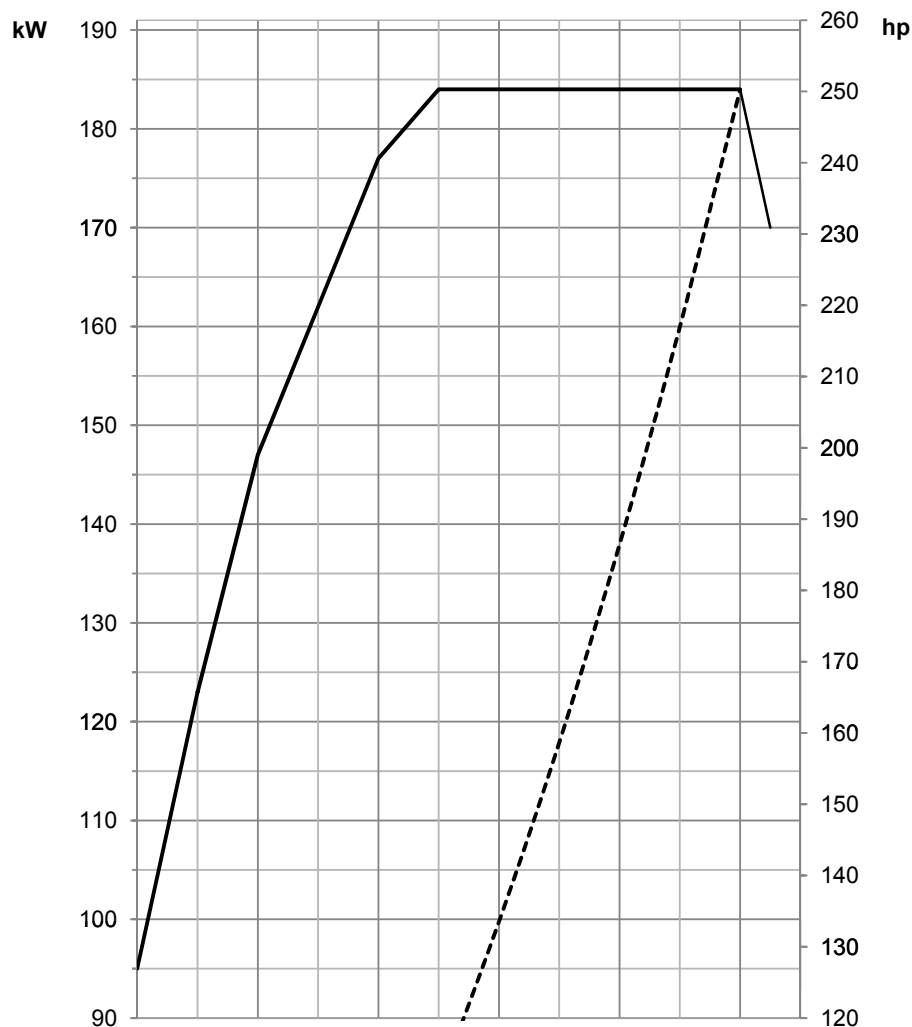


DI09 070M, 184 kW / 250 hp - With heat exchanger (engine ref. 03-02)

DI09 070M, 184 kW / 250 hp - With keel cooling (engine ref. 03-12)

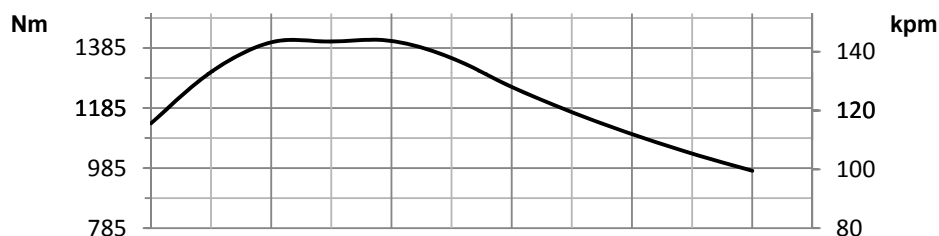
Power

(kW x 1.36 = hp)



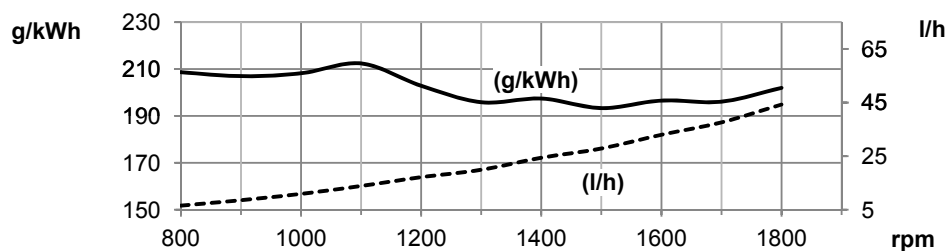
Torque

(Nm / 9.81 = kpm)



Spec. fuel consumption

(g/kWh / 1.36 = g/hph)



----- Propeller curve, assumed exponent 2.5
— Full load curve



Technical data

DI09 070M, 221 kW / 300 hp - With heat exchanger (engine ref. 03-03)

DI09 070M, 221 kW / 300 hp - With keel cooling (engine ref. 03-13)

Emission compliance	Fuel injection system	Rating
EU Stage IIIA and IMO Tier II	PDE	ICFN, Continuous service

	Engine speed (rpm)					Unit
	1200	1400	1500	1700	1800	
Gross power						
Full load curve	203	221	221	221	221	kW
	276	300	300	300	300	hp
Propeller curve (assumed exponent 2.5)	80	118	140	192	221	kW
	109	160	191	261	300	hp
Gross torque	1615	1507	1407	1241	1172	Nm
Spec. fuel consumption						
full load	203	196	195	196	199	g/kWh
3/4 load	203	200	194	197	204	g/kWh
1/2 load	207	206	202	207	215	g/kWh
Propeller curve (assumed exponent 2.5)	20	29	33	45	52	l/h
Heat rejection						
to coolant*	154	157	157	160	163	kW
to main coolant circuit**	131	130	128	129	128	kW
to charge air cooler circuit**	23	27	29	31	35	kW
to exhaust gas	128	132	130	131	134	kW
to surrounding air	10	10	10	10	10	kW
Coolant flow @ back pressure in water circuit for charge air cooler**	167 @0.25	194 @0.33	208 @0.36	236 @0.46	250 @0.50	dm ³ @bar
Max. water inlet temp. to charge air cooler**	38	38	38	38	38	°C
Air consumption	14	17	18	19	21	kg/min
Air temperature						
before charge air cooler**	139	141	141	139	143	°C
after charge air cooler**	40	41	41	41	41	°C
Pressure in intake manifold	1.4	1.4	1.4	1.3	1.4	Bar
Exhaust flow	14	17	18	20	21	kg/min
Exhaust temperature	508	446	419	392	376	°C

* For engines with heat exchanger

** For engines with keel cooling

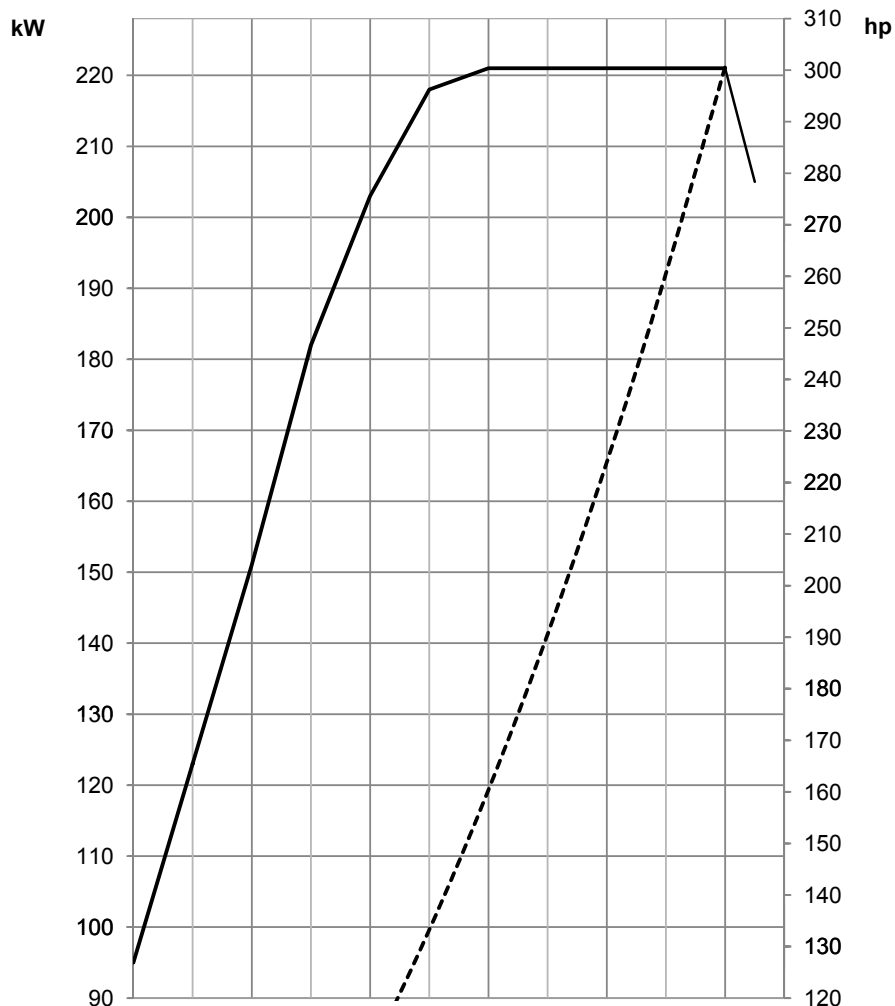


DI09 070M, 221 kW / 300 hp - With heat exchanger (engine ref. 03-03)

DI09 070M, 221 kW / 300 hp - With keel cooling (engine ref. 03-13)

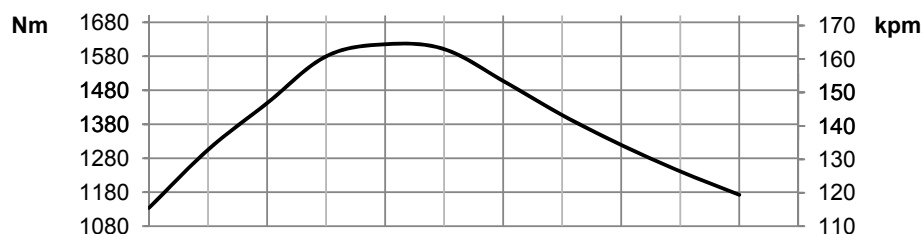
Power

(kW x 1.36 = hp)



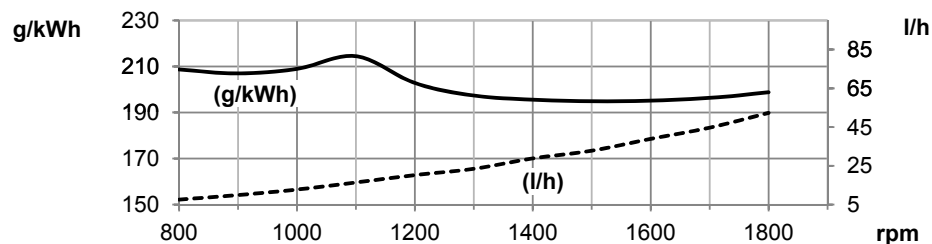
Torque

(Nm / 9.81 = kpm)



Spec. fuel consumption

(g/kWh / 1.36 = g/hph)



----- Propeller curve, assumed exponent 2.5
—— Full load curve



Technical data

DI09 070M, 257 kW / 350 hp - With heat exchanger (engine ref. 03-04)

DI09 070M, 257 kW / 350 hp - With keel cooling (engine ref. 03-14)

Emission compliance	Fuel injection system	Rating
EU Stage IIIA and IMO Tier II	PDE	ICFN, Continuous service

	Engine speed (rpm)				Unit
	1200	1500	1700	1800	
Gross power					
Full load curve	203	245	257	257	kW
	276	333	350	350	hp
Propeller curve (assumed exponent 2.5)	93	163	223	257	kW
	127	222	303	350	hp
Gross torque	1615	1560	1444	1363	Nm
Spec. fuel consumption					
full load	203	198	199	200	g/kWh
3/4 load	203	193	196	201	g/kWh
1/2 load	207	200	202	210	g/kWh
Propeller curve (assumed exponent 2.5)	23	38	52	61	l/h
Heat rejection					
to coolant*	154	175	184	183	kW
to main coolant circuit**	131	144	150	148	kW
to charge air cooler circuit**	23	31	34	35	kW
to exhaust gas	128	152	163	165	kW
to surrounding air	10	12	12	12	kW
Coolant flow @ back pressure in water circuit for charge air cooler**	167 @0.25	208 @0.36	236 @0.46	250 @0.50	dm ³ @bar
Max. water inlet temp. to charge air cooler**	38	38	38	38	°C
Air consumption	14	18	20	21	kg/min
Air temperature					
before charge air cooler**	139	145	145	143	°C
after charge air cooler**	40	42	42	42	°C
Pressure in intake manifold	1.4	1.5	1.4	1.4	Bar
Exhaust flow	14	19	21	21	kg/min
Exhaust temperature	508	470	457	448	°C

* For engines with heat exchanger

** For engines with keel cooling

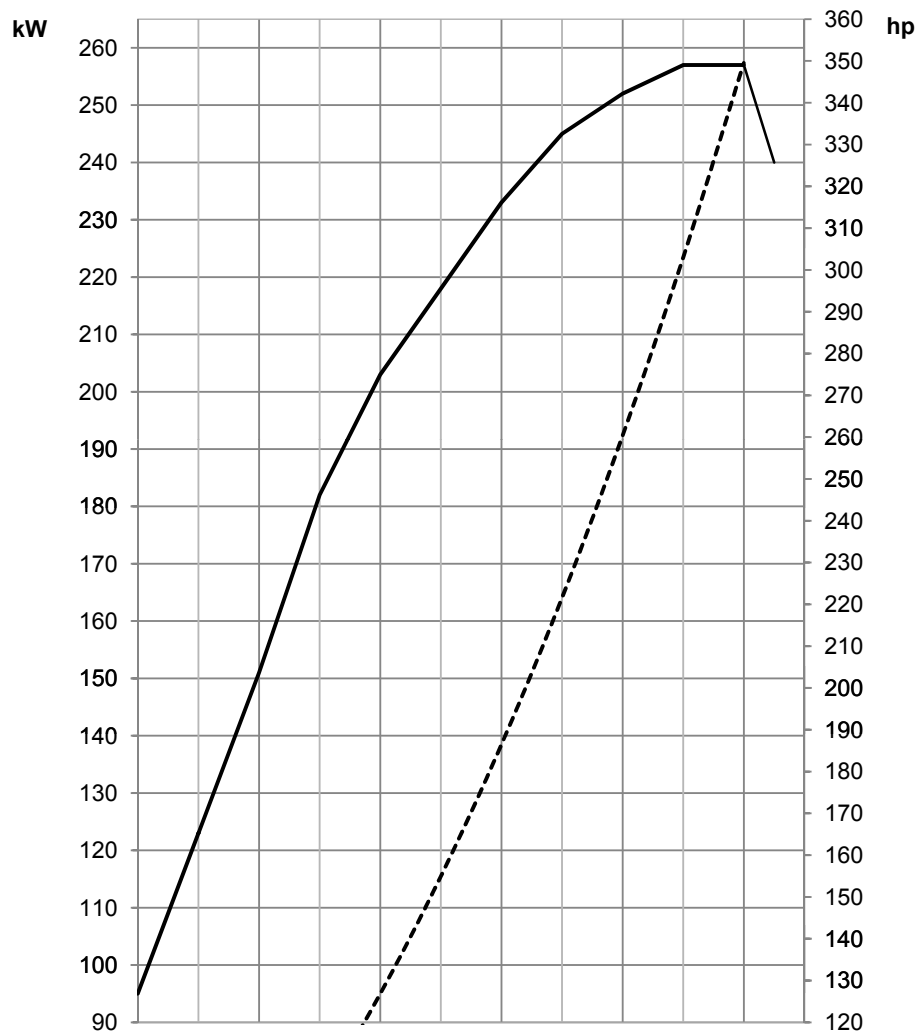


DI09 070M, 257 kW / 350 hp - With heat exchanger (engine ref. 03-04)

DI09 070M, 257 kW / 350 hp - With keel cooling (engine ref. 03-14)

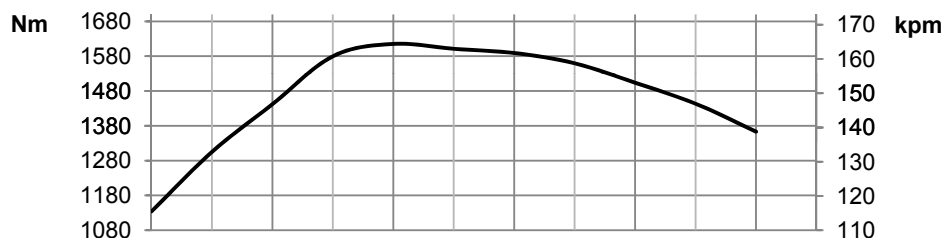
Power

(kW x 1.36 = hp)



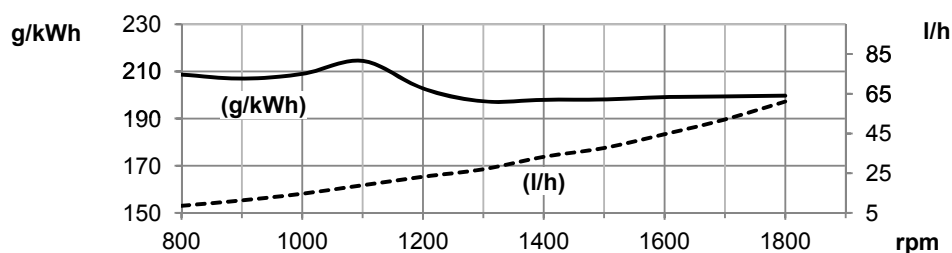
Torque

(Nm / 9.81 = kpm)



Spec. fuel consumption

(g/kWh / 1.36 = g/hph)



----- Propeller curve, assumed exponent 2.5
— Full load curve



Technical data

DI09 072M, 221 kW / 300 hp - With heat exchanger (engine ref. 03-21)

DI09 072M, 221 kW / 300 hp - With keel cooling (engine ref. 03-31)

Emission compliance	Fuel injection system	Rating
EU Stage IIIA and IMO Tier II	PDE	IFN, Intermittent service

	Engine speed (rpm)						Unit
	1200	1300	1500	1800	2000	2100	
Gross power							
Full load curve	204	221	221	221	221	221	kW
	277	300	300	300	300	300	hp
Propeller curve (assumed exponent 2.5)	55	67	95	150	196	221	kW
	74	91	130	204	266	300	hp
Gross torque	1623	1623	1407	1172	1055	1005	Nm
Spec. fuel consumption							
full load	200	200	192	196	203	210	g/kWh
3/4 load	196	199	194	199	208	213	g/kWh
1/2 load	199	208	202	210	220	228	g/kWh
Propeller curve (assumed exponent 2.5)	14	17	23	36	48	55	l/h
Heat rejection							
to coolant*	155	163	156	164	172	178	kW
to main coolant circuit**	135	137	127	129	137	142	kW
to charge air cooler circuit**	20	26	29	35	35	36	kW
to exhaust gas	122	136	122	127	137	150	kW
to surrounding air	10	11	10	10	11	11	kW
Coolant flow @ back pressure in water circuit for charge air cooler**	143 @0.19	155 @0.22	179 @0.28	214 @0.37	238 @0.46	250 @0.50	dm ³ @bar
Max. water inlet temp. to charge air cooler**	38	38	38	38	38	38	°C
Air consumption	13	15	17	21	22	22	kg/min
Air temperature							
before charge air cooler**	134	145	141	144	139	138	°C
after charge air cooler**	40	42	42	43	42	42	°C
Pressure in intake manifold	1.3	1.4	1.4	1.4	1.3	1.2	Bar
Exhaust flow	13	16	18	21	23	23	kg/min
Exhaust temperature	514	490	401	359	368	388	°C

* For engines with heat exchanger

** For engines with keel cooling

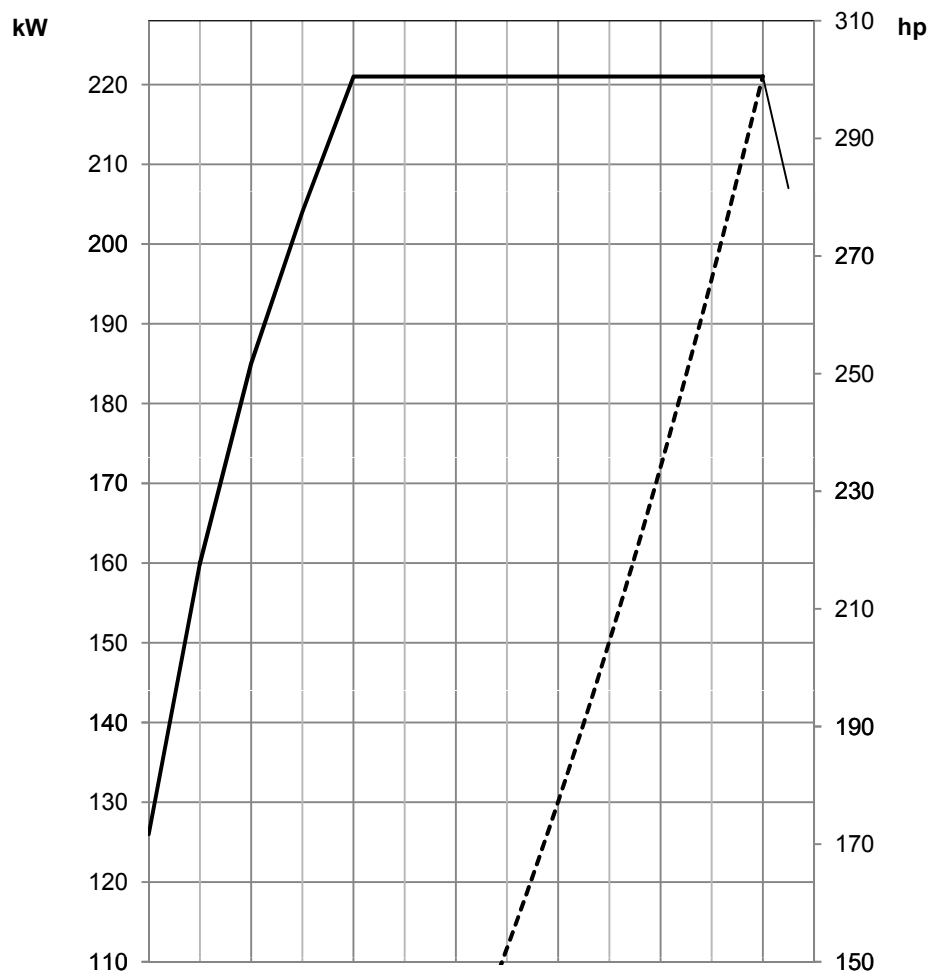


DI09 072M, 221 kW / 300 hp - With heat exchanger (engine ref. 03-21)

DI09 072M, 221 kW / 300 hp - With keel cooling (engine ref. 03-31)

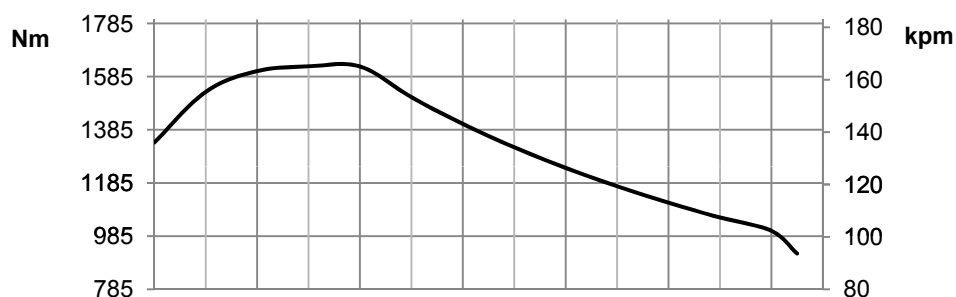
Power

(kW x 1.36 = hp)



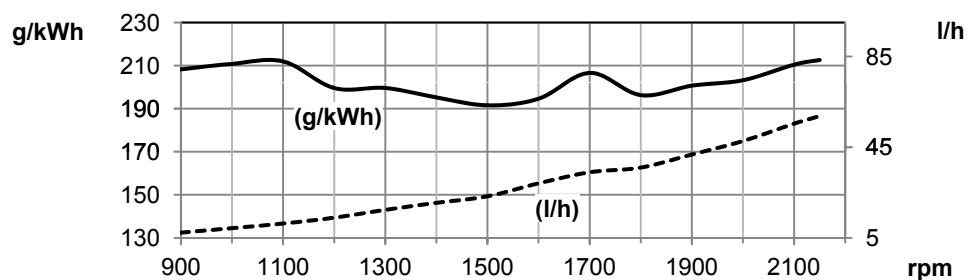
Torque

(Nm / 9.81 = kpm)



Spec. fuel consumption

(g/kWh / 1.36 = g/hph)



----- Propeller curve, assumed exponent 2.5
— Full load curve



Technical data

DI09 072M, 257 kW / 350 hp - With heat exchanger (engine ref. 03-22)

DI09 072M, 257 kW / 350 hp - With keel cooling (engine ref. 03-32)

Emission compliance	Fuel injection system	Rating
EU Stage IIIA and IMO Tier II	PDE	IFN, Intermittent service

	Engine speed (rpm)					Unit
	1200	1500	1800	2000	2100	
Gross power						
Full load curve	204	256	256	257	257	kW
	277	348	348	350	350	hp
Propeller curve (assumed exponent 2.5)	63	111	175	227	257	kW
	86	151	238	309	350	hp
Gross torque	1623	1630	1358	1227	1169	Nm
Spec. fuel consumption						
full load	200	195	196	204	209	g/kWh
3/4 load	196	193	197	205	211	g/kWh
1/2 load	199	198	205	215	222	g/kWh
Propeller curve (assumed exponent 2.5)	16	27	41	55	64	l/h
Heat rejection						
to coolant*	155	182	185	194	200	kW
to main coolant circuit**	135	147	146	153	159	kW
to charge air cooler circuit**	20	35	39	41	41	kW
to exhaust gas	122	150	152	167	177	kW
to surrounding air	10	12	12	12	13	kW
Coolant flow @ back pressure in water circuit for charge air cooler**	143 @0.19	179 @0.28	214 @0.37	238 @0.46	250 @0.50	dm ³ @bar
Max. water inlet temp. to charge air cooler**	38	38	38	38	38	°C
Air consumption	13	19	22	23	23	kg/min
Air temperature						
before charge air cooler**	135	154	152	149	149	°C
after charge air cooler**	41	44	44	44	44	°C
Pressure in intake manifold	1.3	1.6	1.5	1.4	1.3	Bar
Exhaust flow	13	20	22	24	24	kg/min
Exhaust temperature	514	441	402	415	427	°C

* For engines with heat exchanger

** For engines with keel cooling



DI09 072M, 257 kW / 350 hp - With heat exchanger (engine ref. 03-22)

DI09 072M, 257 kW / 350 hp - With keel cooling (engine ref. 03-32)

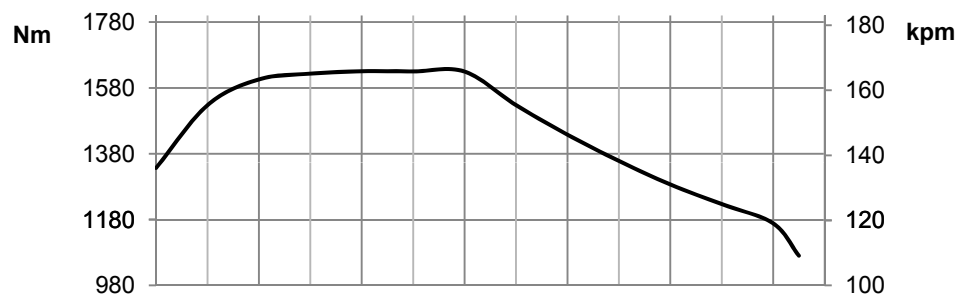
Power

(kW x 1.36 = hp)



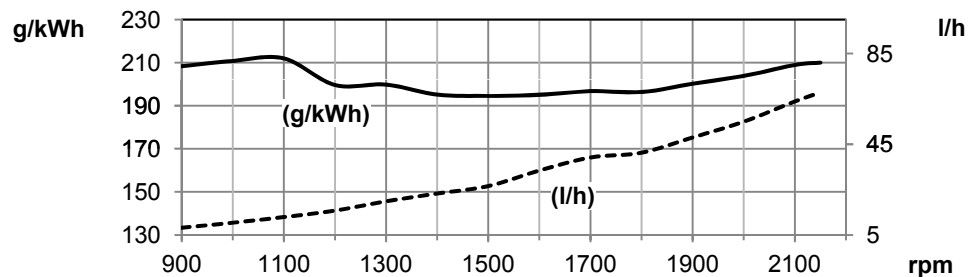
Torque

(Nm / 9.81 = kpm)



Spec. fuel consumption

(g/kWh / 1.36 = g/hph)



----- Propeller curve, assumed exponent 2.5
— Full load curve



Technical data

DI09 072M, 294 kW / 400 hp - With heat exchanger (engine ref. 03-23)

DI09 072M, 294 kW / 400 hp - With keel cooling (engine ref. 03-33)

Emission compliance	Fuel injection system	Rating
EU Stage IIIA and IMO Tier II	PDE	IFN, Intermittent service

	Engine speed (rpm)						Unit
	1200	1500	1800	1900	2000	2100	
Gross power							
Full load curve	205	256	294	294	294	294	kW
	279	348	400	400	400	400	hp
Propeller curve (assumed exponent 2.5)	73	127	200	229	260	294	kW
	99	172	272	311	354	400	hp
Gross torque	1631	1630	1560	1478	1404	1337	Nm
Spec. fuel consumption							
full load	200	195	201	202	205	209	g/kWh
3/4 load	196	193	196	201	203	210	g/kWh
1/2 load	199	198	202	207	210	217	g/kWh
Propeller curve (assumed exponent 2.5)	18	30	47	55	63	73	l/h
Heat rejection							
to coolant*	156	182	211	214	218	226	kW
to main coolant circuit**	136	147	169	170	172	177	kW
to charge air cooler circuit**	20	35	42	44	46	49	kW
to exhaust gas	123	150	191	193	197	204	kW
to surrounding air	10	12	14	14	14	15	kW
Coolant flow @ back pressure in water circuit for charge air cooler**	143 @0.19	179 @0.28	214 @0.37	226 @0.41	238 @0.46	250 @0.50	dm ³ @bar
Max. water inlet temp. to charge air cooler**	38	38	38	38	38	38	°C
Air consumption	13	19	22	23	24	25	kg/min
Air temperature							
before charge air cooler**	135	154	158	159	161	165	°C
after charge air cooler**	41	44	45	46	46	47	°C
Pressure in intake manifold	1.3	1.6	1.6	1.6	1.5	1.5	Bar
Exhaust flow	13	20	23	24	25	26	kg/min
Exhaust temperature	515	441	476	462	457	456	°C

* For engines with heat exchanger

** For engines with keel cooling

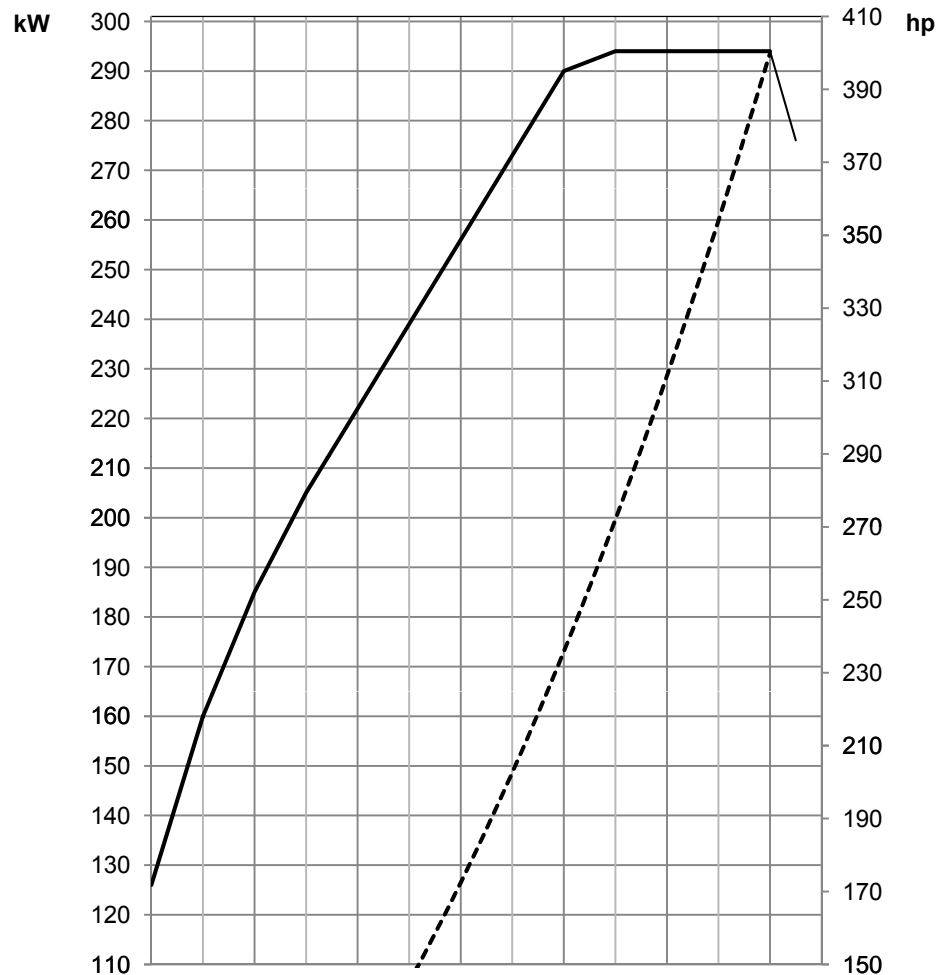


DI09 072M, 294 kW / 400 hp - With heat exchanger (engine ref. 03-23)

DI09 072M, 294 kW / 400 hp - With keel cooling (engine ref. 03-33)

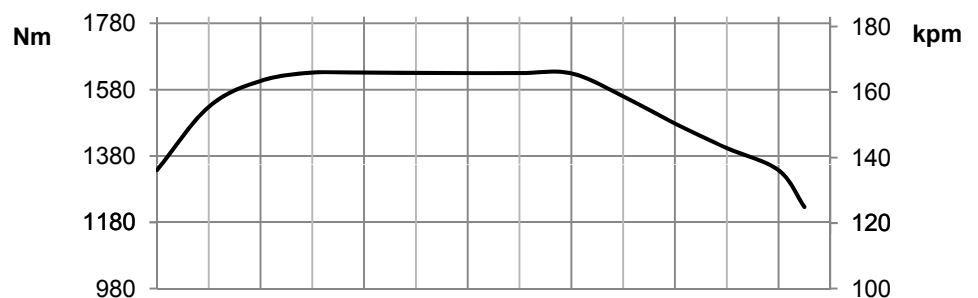
Power

(kW x 1.36 = hp)



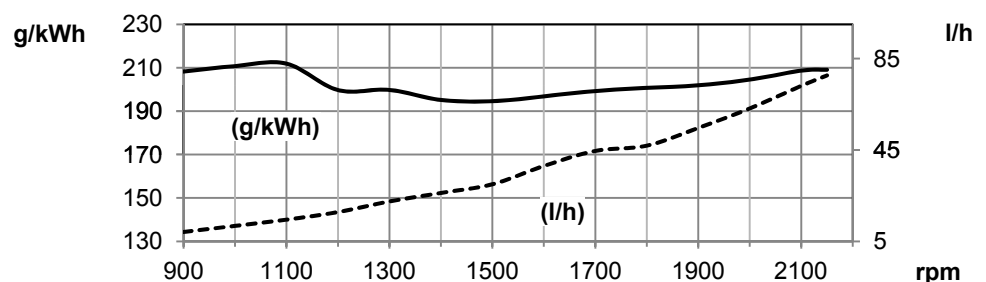
Torque

(Nm / 9.81 = kpm)



Spec. fuel consumption

(g/kWh / 1.36 = g/hph)



----- Propeller curve, assumed exponent 2.5
—— Full load curve



Basic dimensions

The basic dimensions are indicated with coordinates. The coordinate system is three dimensional and consists of three planes at straight angles to each other; x, y and z. The dimensions are indicated in mm from crankshaft centre.

DI09 070/072M - With heat exchanger

1 Air intake (Ø 150 mm)

1	x	+201
	y	-141
	z	+517

2 Exhaust outlet (Ø 117.35 mm)

2	x	-14
	y	+269
	z	+517

3 Sea water inlet (Ø 50 mm)

3	x	+2
	y	+284
	z	+146

4 Sea water outlet (Ø 50 mm)

4	x	-429
	y	+374
	z	+315

5 Coolant drain (fresh water)

6 Fresh water filling

7 Fuel inlet (union nut M16x1.5)

7	x	-493
	y	-280
	z	+131

8 Fuel return (union nut M16x1.5)

8	x	-543
	y	-280
	z	+131

9 Oil filling in valve cover
(optional position)

10 Oil filling/dipstick

11 Oil drain plug

12 Connection from cab heater (M22x1.5)

12	x	-852
	y	+347
	z	+90

13 Connection to cab heater (M18x1.5)
(remove lid to access)

13	x	-1065
	y	+108
	z	+396

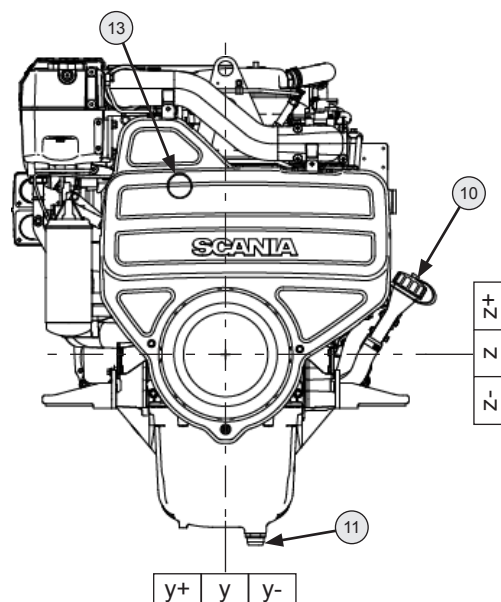
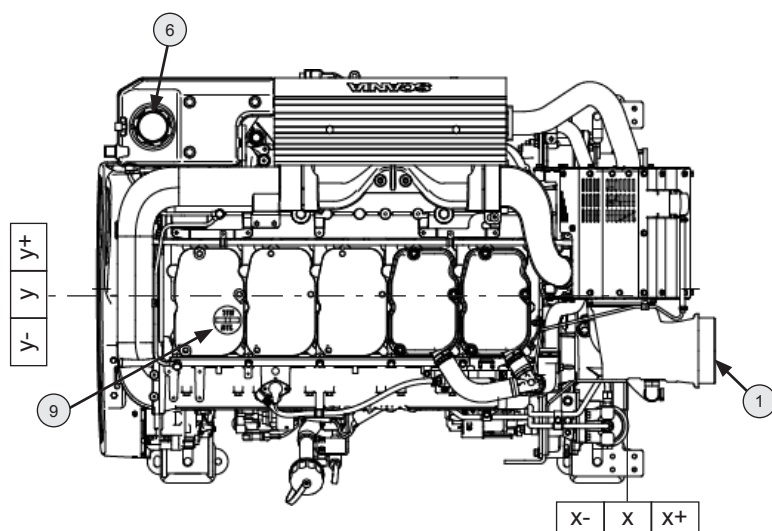
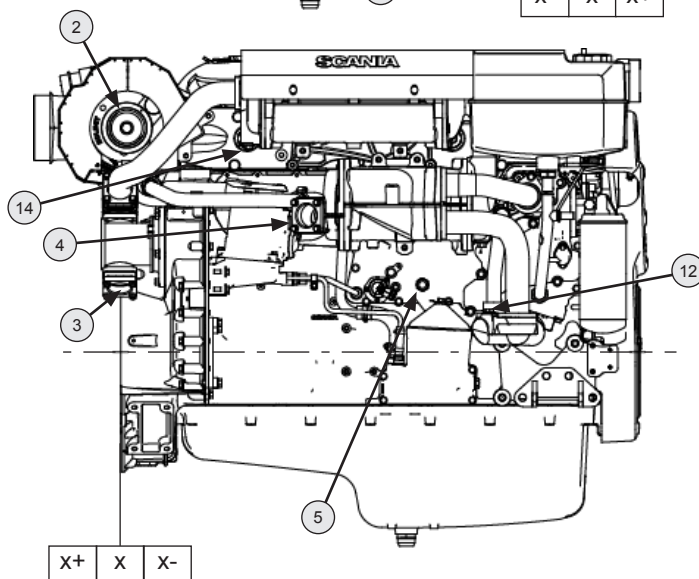
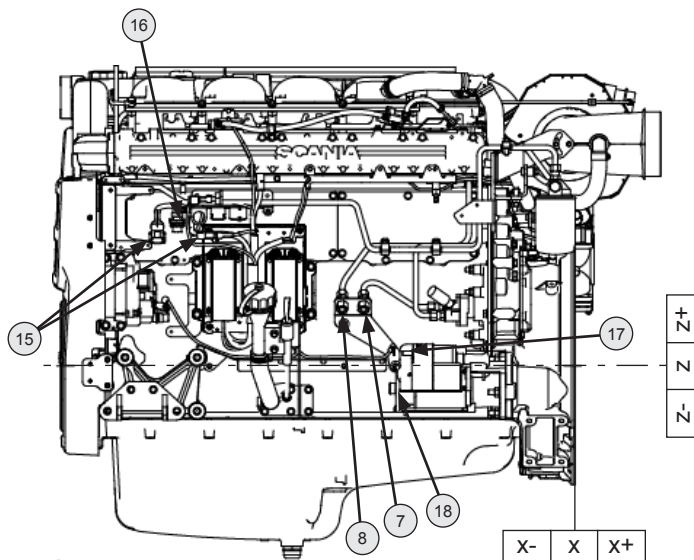
14 Sacrificial anode (2x)

15 Customer interface EMS

16 Diagnostic socket

17 Battery connection + (M10)

18 Battery connection - (M12)



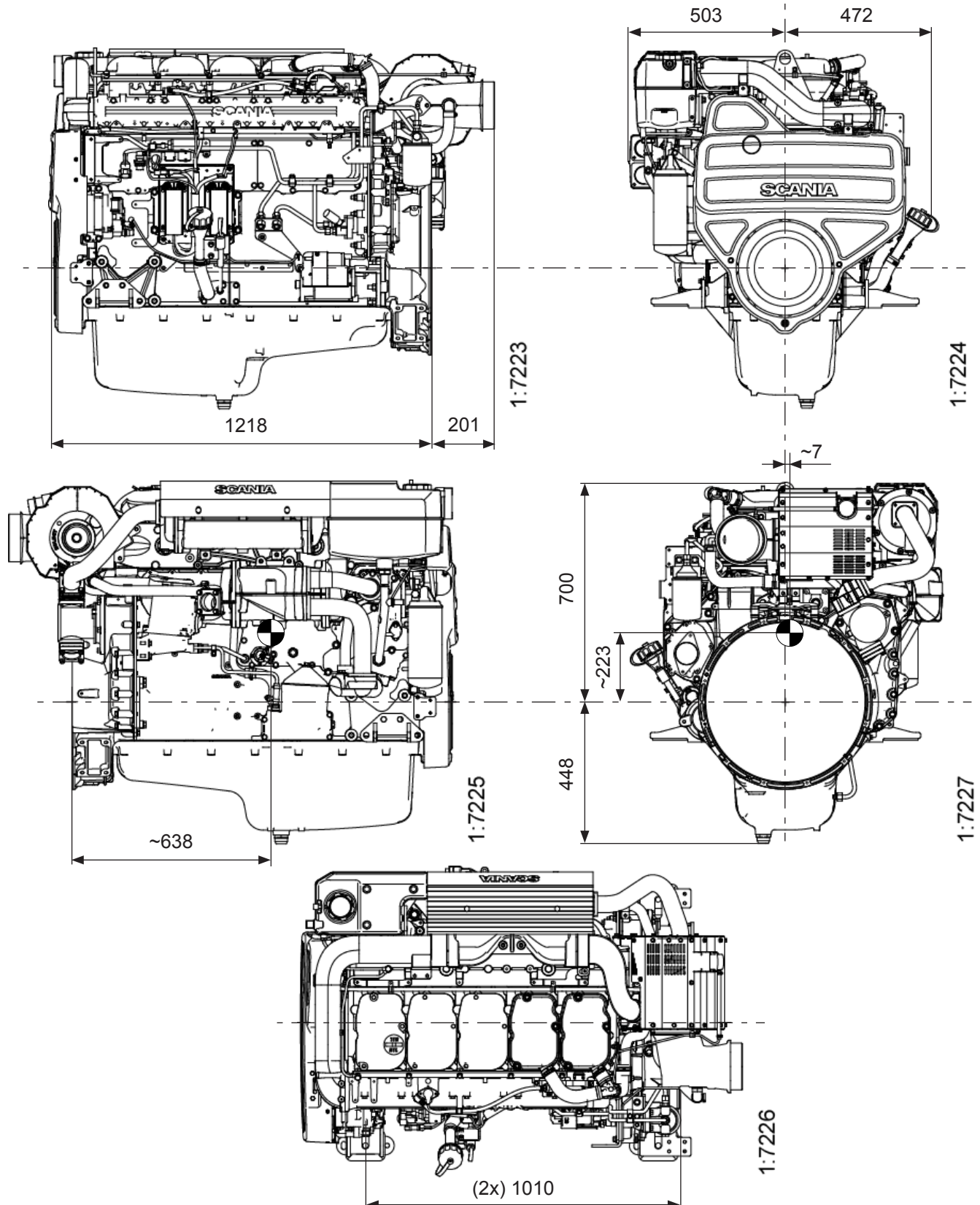


Dimensional drawings

All sketches are only intended as general sales information and must not be used for any installation purposes. The values for centre of gravity applies for engines with standard equipment including coolant. All dimensions are indicated in mm.

DI09 070/072M - With heat exchanger

Drawing no 2 134 590



4A



Basic dimensions

The basic dimensions are indicated with coordinates. The coordinate system is three dimensional and consists of three planes at straight angles to each other; x, y and z. The dimensions are indicated in mm from crankshaft centre.

DI09 070/072M - With keel cooling, double circuit

1 Air intake (Ø 150 mm)

1	x	+201
	y	-141
	z	+517

2 Exhaust outlet (Ø 117.35 mm)

2	x	-14
	y	+269
	z	+517

3 Main coolant inlet (Ø 63 mm)

3	x	-917
	y	+505
	z	+220

4 Main coolant outlet (Ø 63 mm)

4	x	-1193
	y	+430
	z	+382

5 Coolant drain/filling (fresh water)

6 Fuel inlet (union nut M16x1.5)

6	x	-493
	y	-280
	z	+131

7 Fuel return (union nut M16x1.5)

7	x	-543
	y	-280
	z	+131

8 Oil filling in valve cover (optional position)

9 Oil filling/dipstick

10 Oil drain plug

11 Connection from cab heater (M22x1.5)

11	x	-852
	y	+347
	z	+90

12 Connection to cab heater (M18x1.5)
(remove lid to access)

12	x	-1065
	y	+108
	z	+396

13 Customer interface EMS

14 Diagnostic socket

15 Battery connection + (M10)

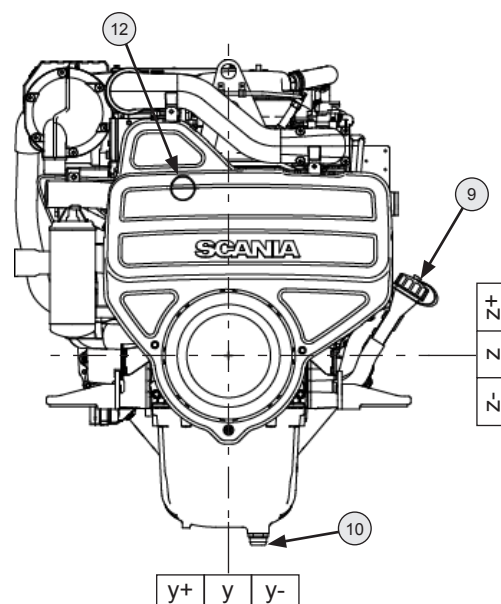
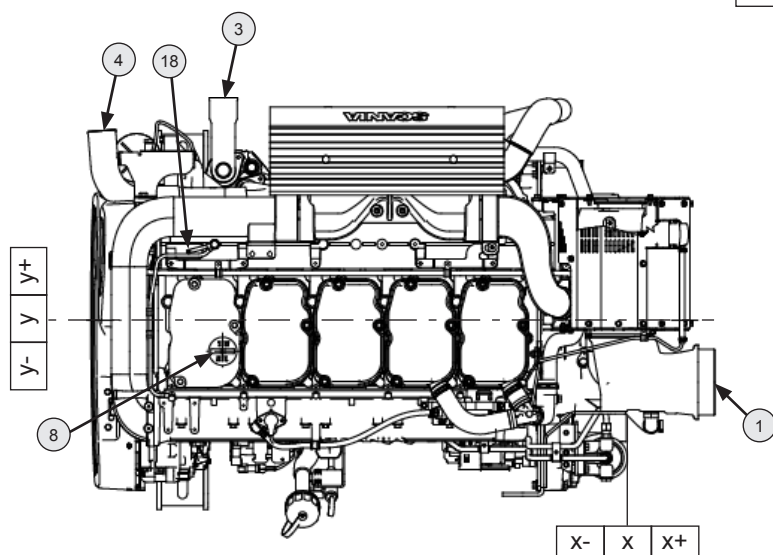
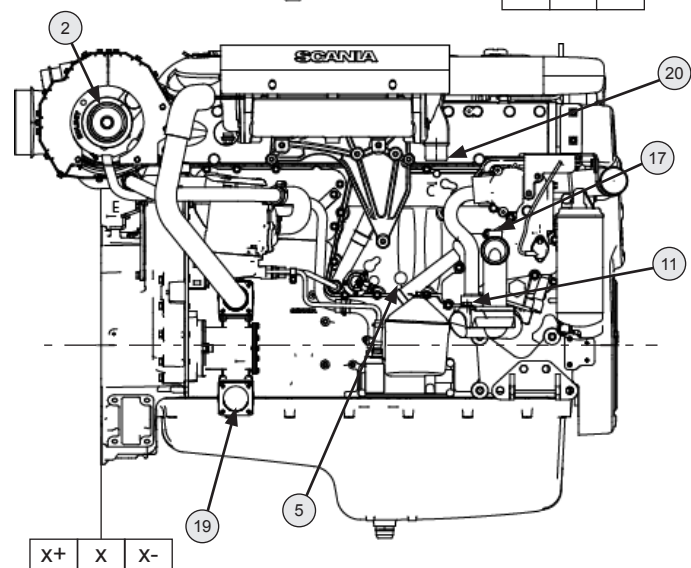
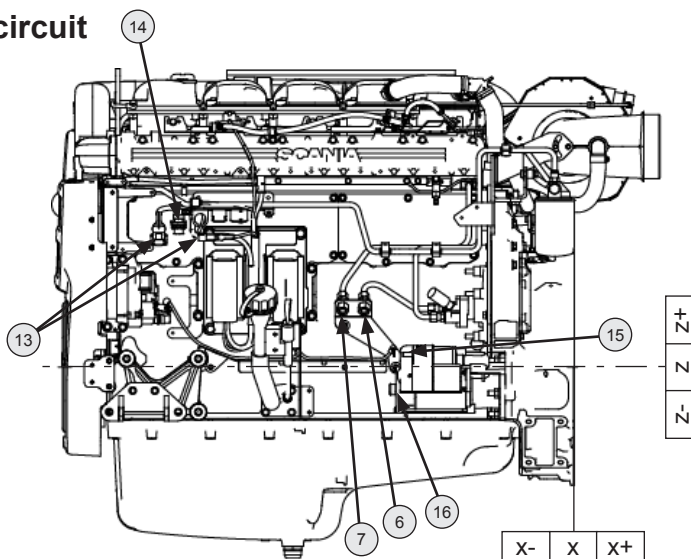
16 Battery connection - (M12)

17 Static line (Ø 32 mm)

18 Coolant bleed pipe (Ø 8 mm)

19 Coolant inlet from CAC external circuit (Ø 54 mm)

20 Coolant outlet to CAC external circuit (Ø 54 mm)



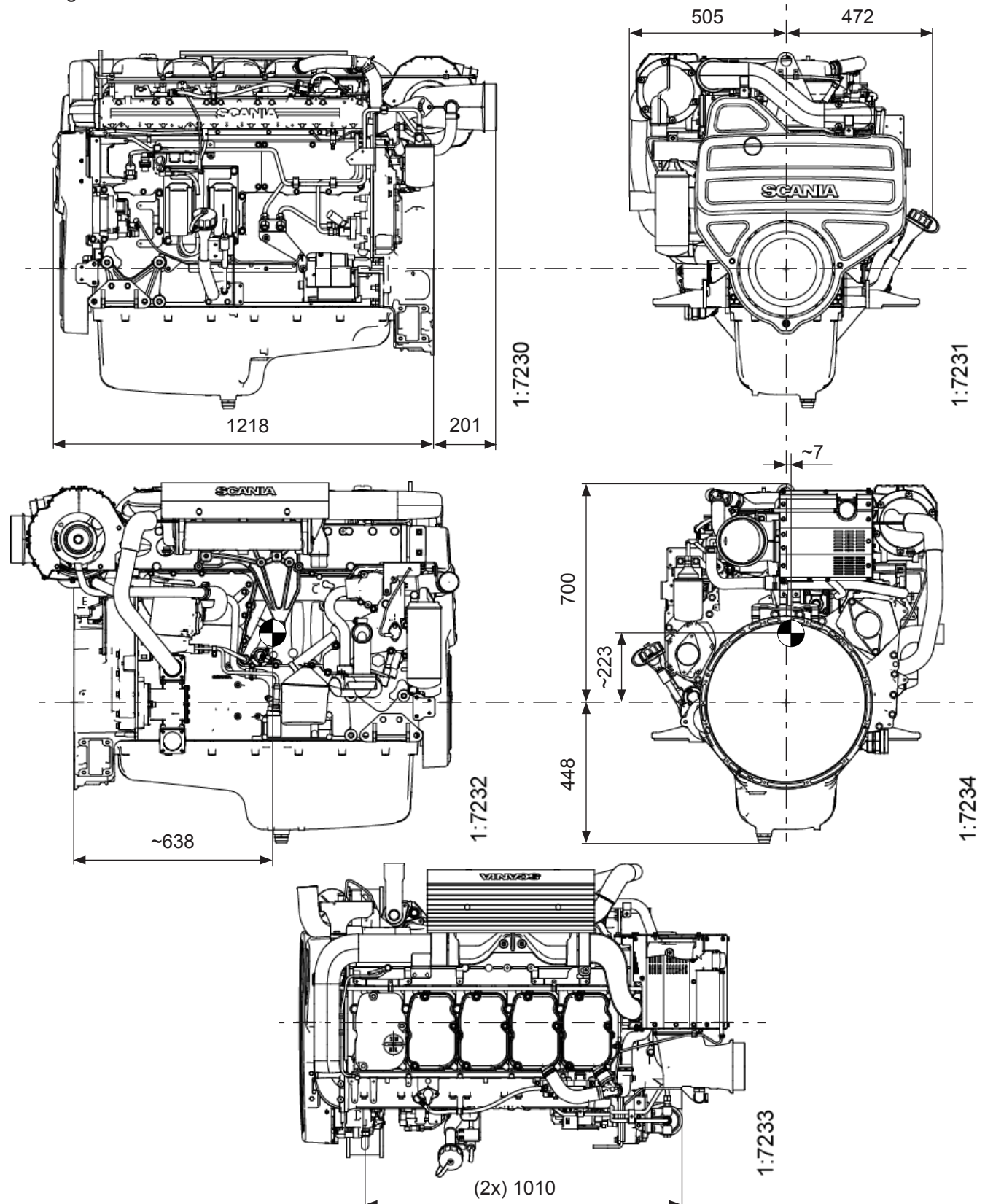


Dimensional drawings

All sketches are only intended as general sales information and must not be used for any installation purposes. The values for centre of gravity applies for engines with standard equipment including coolant. All dimensions are indicated in mm.

DI09 070/072M - With keel cooling, double circuit

Drawing no 2 134 591

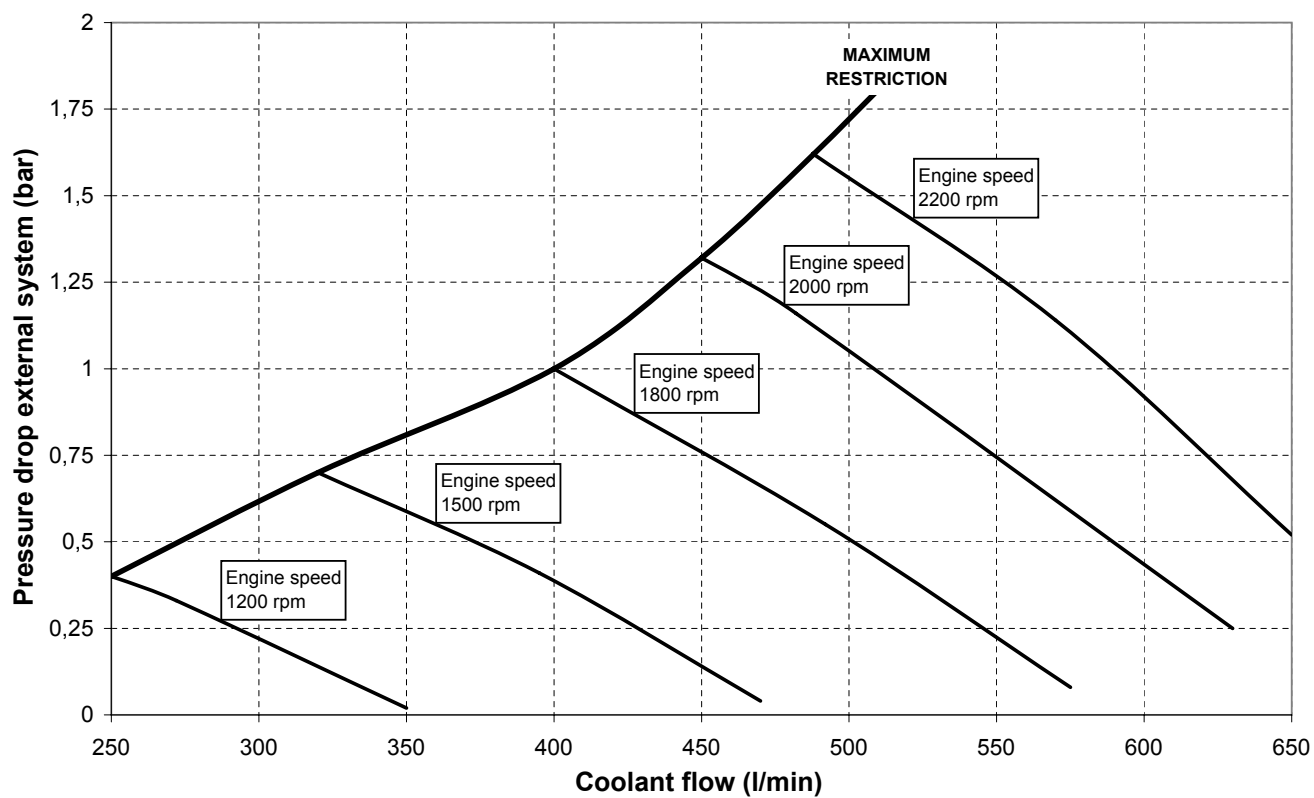


4A



Coolant flow

The coolant flow depends on the pressure drop in the external system according to the graph below.
Valid for all DI09.





Equipment list

S = Standard

O = Optional

For illustrations and technical data, please see 'Equipment data'.

Drawings referred to in this section are available on Scania's Technical Information Library, TIL, under 'Drawings industrial & marine engines' or can be ordered via Pre-sales FRAS.

Ref	Description	Requirements	Remark	Drw No
10K	TORSIONAL VIBRATION CALCULATIONS			
-00	S Without			
-01	O Single engine installation with 1-3 driven masses. Typical genset or direct driven propeller installations.		Note! TVC can not be ordered directly.	
-02	O Several driven masses both behind and/or in front of the engine. Genset with auxiliary devices, propeller installations with front PTO, propeller installations with marine transmissions.		Torsional vibration calculations must be requested with the TVC form available at https://sail.scania.com and sent to factory for evaluation, before an actual order can be placed.	
-03	O Branched drive train, multi engine (advanced) installations, belt driven units etc.		If a TVC calculation has been rejected, further investigation is possible and will be charged per hour.	
10M	CLASSIFICATION			
	Note! For information about approved engines, access SAIL at http://sail.scania.com .			
-00	S Without			
-01	O ABS: American Bureau of Shipping	Req. 65-03		
-02	O BV: Bureau Veritas	Req. 65-02 or -03		
-03	O DNV: Det Norske Veritas	Req. 65-02 or -03		
-04	O GL: Germanischer Lloyd	Req. 65-02 or -03		
-05	O LR: Lloyds Register	Req. 65-03		
-06	O RINA: Registro Italiano Navale	Req. 65-03		
-11	O SF: Sjöfartsverket			
-12	O RS: Russian Maritime Register of Shipping	Req. 65-02 or -03		
-13	O RRR: Russian River Register			
-14	O CCS: China Classification Society	Req. 65-02 or -03		
-15	O TL: Türk Loydu	Req. 65-03		
-16	O CRS: Croatian Register of Shipping	Req. 65-02 or -03		



Ref	Description	Requirements	Remark	Drw No
100	TYPE OF IMO CERTIFICATE			
	<i>Note! Ships in Russia: All engines above 130 kW on vessels with flag state Russia, except emergency engines, must have EIAPP certificate issued by Russian Maritime Register of Shipping, 10O-05.</i>			
	<i>Note! Ships in China: All engines above 130 kW on vessels with flag state China, except emergency engines, must have EIAPP certificate issued by China Classification Society, 10O-06.</i>			
	<i>Note! EIAPP for German-flagged vessels will have an additional fee due to extra costs caused by the German Administration.</i>			
-00	S Without			
-01	O EIAPP certificate issued by Germanischer Lloyd - GL			
-02	O S.o.C certificate issued by Germanischer Lloyd - GL			
-05	O EIAPP certificate issued by Russian Maritime Register of Shipping - RS	Req. 10M-12	No EIAPP certificate will be issued if the engine is not classified by RS.	
-06	O EIAPP certificate issued by China Classification Society - CCS	Req. 10M-14	No EIAPP certificate will be issued if the engine is not classified by CCS.	
25A	CONNECTION EMS			
<i>The connector kit contains pins and connector for connecting to the electrical interface on the engine. The customer will attach the wirings to the connectors himself.</i>				
-00	O Without	Req. 26C-01 or 27C-01/02		
-01	S With connector kit	Req. 26C-00 and 27C-00		
-02	O With cable 6.3 m incl. connector	Req. 26C-00 and 27C-00		
25B	OIL TEMP, Integrated oil temp. sensor			
-00	S Without			
-01	O With			
25C	COOLANT LEVEL MONITOR			
<i>The coolant level monitor is used to ensure that the coolant level is not dropping below a critical level that leaves the temperature sensor in the air. If the temperature sensor is not in contact with the coolant, boiling will not be detected, causing a risk for engine damages. The coolant level monitor is strongly recommended since the engine room is mostly remote operated.</i>				
-00	S Without		Note! Requires a level monitor from an external manufacturer.	
-01	O Level monitor 2-pole, normally closed (when mounted in application)	Req. 28F-01, -02, -03 or -04		
25D	STARTER			
-00A	O Without			
-01	S 2-pole, 7 kW, EMS controlled			1 882 043
25E	ALTERNATOR			
<i>In the selection of an alternator the total electrical consumption must be considered. It is essential that a reserve of electrical power is available in order to avoid voltage drop in the EMS and problems with equipment such as instrumentation and lighting.</i>				
-00A	O Without			
-01	S 2-pole, 100A, EMS controlled			1 743 548
-04	O 2-pole, 2 x 100A, EMS controlled			1 743 548



Ref	Description	Requirements	Remark	Drw No
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25F ENGINE HEATER

The engine heater will ensure that the engine keeps a temperature level above the ambient for easier starting. Since a warm engine have less friction, emission and operates more smoothly due to warm oil it will be more environmental friendly and significantly reduce engine wear. Engine heater 1500W with thermostat is recommended for customers that will use the heater continuously. Engine heater 500W is recommended for installations with insufficient fusing for using 1500W.

-00	S	Without		
-01	O	1500 W/230 V, plug in type	Only for engines with keel cooling	1 722 729
-06	O	1500 W/115 V, plug in with thermostat		2 074 315
-07	O	1500 W/230 V, plug in with thermostat		2 074 315
-08	O	550 W/230 V, plug in with thermostat		2 074 315
-09	O	550 W/115 V, plug in with thermostat		2 074 315

25G POWER CABLE BETWEEN ALTERNATOR AND STARTER

The power cable is the feeding cable from the alternator to the starter motor for charging the batteries. The cable is mandatory to have either supplied by Scania or by the customer. The alternator requires constant 24V connected at B+ in order to work correctly.

-00	O	Without		
-01A	S	With, for single alternator configuration	Req. 25E-01	Note! The power cable is non-fused and not approved for classification.
-02	O	With, for double alternator configuration	Req. 25E-04	

25H OIL LEVEL SENSOR

The oil level sensor enables the engine operator to electronically read the level of oil in the engine as a part of the daily inspection. It is a complement to oil dipstick. The signal must be taken care of by the customer directly from the sensor.

-00	S	Without		
-02	O	With, but without electrical connection (connected and monitored by customer)	Req. 60-01	1 891 846

SCANIA INSTRUMENTATION

26C BASE SYSTEM

-00	S	Without		
-01	O	With	Req. 10M-00, -13 or -16 Req. 25G-01 or -02; 26E-01, -02, -03 or -04; 28O-04	2 181 152

26D ACCELERATOR POSITION SENSOR

-00	S	Without	Prepared for non-Scania throttle when Base system is ordered.	
-01	O	Sensor with cable 2m	Req. 10M-00, -13 or -16 Req. 26C-01	1 364 185
-02	O	Sensor with cable 8m	Req. 10M-00(, -13 or -16) Req. 26C-01	1 364 185



Ref	Description	Requirements	Remark	Drw No
26E	CABLE LENGTH BETWEEN MSB AND CBC			
-00	S Without	Req. 26C-00		
-01	O Cable length 2m	Req. 10M-00, -13 or -16 Req. 26C-01		
-02	O Cable length 8m	Req. 10M-00, -13 or -16 Req. 26C-01		
-03	O Cable length 12m	Req. 10M-00, -13 or -16 Req. 26C-01		
-04	O Cable length 24m	Req. 10M-00, -13 or -16 Req. 26C-01		
26F	CONTROL PANEL			
-00	S Without			
-03	O With, one panel	Req. 10M-00, -13 or -16 Req. 26C-01		2 014 191
-04	O With, one panel with cover	Req. 10M-00, -13 or -16 Req. 26C-01		2 014 191
26G	INSTRUMENT PANEL			
-00	S Without			
-01	O With, 2-pole	Req. 10M-00, -13 or -16 Req. 26C-01		2 013 194
-02	O With cover, 2-pole	Req. 10M-00, -13 or -16 Req. 26C-01		2 013 194
26H	SCANIA EMS DISPLAY			
<i>The EMS display is used to read out data, for example fuel consumption and configure specific parameters in the Engine Management System, for example alarm levels. The information is presented in an LCD display. It is also possible to read fault codes via the EMS display.</i>				
-00	S Without			
-01	O Instrument panel, 2-pole. Including cable harness to CBC, 3m	Req. 10M-00, -13 or -16 Req. 26C-01		1 761 984
26J	REMOTE CONTROL BOX			
<i>The remote control box contains a switch for 'remote'/'local' operation, in 'local' mode the engine can't be remotely started. This is a safety feature.</i>				
-00	S Without			
-01	O With cable, length 4m	Req. 10M-00, -13 or -16 Req. 26C-01		1 902 912



Ref	Description	Requirements	Remark	Drw No
SCANIA INSTRUMENTATION 2.0				
Scania Instrumentation 2.0 is an electrical system with two levels - without or with type approval. All 2.0 options have a family code that starts with 27. Note! Options that have codes that start with 27 are <u>not</u> possible to combine with options that have codes that starts with 26.				
27C BASE SYSTEM 2.0				
Includes: • Main Supply Box, MSB: fuses, diodes and relays • Main Control Display, MCD: coordinator and 5.7" colour touch screen (to view engine data and control the engine). Must be located in engine room when type approved. • 3 or 6 m cable to engine Cable between MSB and MCD is ordered separately (ref.code 27E).				
-00	S Without			
-01	O With 3 m cable	Req. 10M-00 or 27M-01 Req. 26C-00		2 135 526
-02	O With 6 m cable	Req. 10M-00 or 27M-01 Req. 26C-00		2 135 526
27D ACCELERATOR POSITION SENSOR				
-00	S Without			
-01	O With	Not with 27C-00 Req. 28O-04 or -05	Only compatible with redundant throttle on the ECU	1 364 185
27E CABLE LENGTH BETWEEN MSB AND MCD				
-00	S Without	Req. 27C-00		
-01	O Cable length 3 m	Req. 27C-01 or -02		2 135 526
-02	O Cable length 6 m	Req. 27C-01 or -02		2 135 526
-04	O Cable length 12 m	Req. 27C-01 or -02	Cable length 12, 26 and 46 m is only available if not type approved/not with 27M-01.	2 135 526
-08	O Cable length 26 m	Req. 27C-01 or -02		2 135 526
-10	O Cable length 46 m	Req. 27C-01 or -02		2 135 526
27F CONTROL PANEL				
Includes start key, engine speed switches and 2 m cable. Can be connected to the Main Control Display (MCD) or to an Extra Control Display (ECD).				
-00	S Without			
-01	O 1 set incl. 2 m cable	Req. 27C-01 or -02		2 095 987
-02	O 1 set incl. 2 m cable with cover	Req. 27C-01 or -02		2 095 987
-03	O 2 sets incl. 2 m cable	Req. 27C-01 or -02 Not with 27G-00		2 095 987
-04	O 2 sets incl. 2 m cable with cover	Req. 27C-01 or -02 Not with 27G-00		2 095 987
-05	O 3 sets incl. 2 m cable	Req. 27C-01 or -02 Not with 27G-00 or -01		2 095 987
-06	O 3 sets incl. 2 m cable with cover	Req. 27C-01 or -02 Not with 27G-00 or -01		2 095 987



Ref	Description	Requirements	Remark	Drw No
27G	EXTRA CONTROL DISPLAY (ECD)			
	<i>5.7" colour touch screen. Connected to the Main Control Display (MCD) by an Ethernet cable. Cables to MCD and ECD-switch are ordered separately (ref. codes 27H/J/K/L).</i>			
-00	S Without	Req. 27H-00, 27J-00, 27K-00 and 27L-00		
-01	O 1 display	Req. 27C-01 or -02, 27H-00, 27K-00 and 27L-00 Not with 27J-00		2 077 118
-02	O 2 displays	Req. 27C-01 or -02 and 27L-00 Not with 27H-00, 27J-00 or 27K-00	Including switch (connected between MCD and ECD)	2 077 118
-03	O 3 displays	Req. 27C-01 or -02 Not with 27H-00, 27J-00, 27K-00 or 27L-00	Including switch (connected between MCD and ECD)	2 077 118
27H	CABLE LENGTH BETWEEN MCD AND ECD-SWITCH			
-00	S Without			
-01	O 10 m			2 135 526
-02	O 20 m			2 135 526
-03	O 50 m			2 135 526
27J	CABLE LENGTH TO EXTRA CONTROL DISPLAY (ECD) 1			
-00	S Without			
-01	O 10 m			2 135 526
-02	O 20 m			2 135 526
-03	O 50 m			2 135 526
27K	CABLE LENGTH TO EXTRA CONTROL DISPLAY (ECD) 2			
-00	S Without			
-01	O 10 m			2 135 526
-02	O 20 m			2 135 526
-03	O 50 m			2 135 526
27L	CABLE LENGTH TO EXTRA CONTROL DISPLAY (ECD) 3			
-00	S Without			
-01	O 10 m			2 135 526
-02	O 20 m			2 135 526
-03	O 50 m			2 135 526
27M	TYPE APPROVED INSTRUMENTATION			
	<i>Includes Safety Device Unit (SDU), which must be located in engine room, and sensors for oil, water and fuel pressure, water temperature and engine speed. The SDU and sensors are configured with an engine shutdown function. Cables to MSB and engine are ordered separately (ref. codes 27N/P).</i>			
-00	S Without	Req. 27N-00 and 27P-00		
-01	O With	Req. 27C-01 or -02 Req. 27E-01 or -02 Not with 27N-00 or 27P-00	<u>Note!</u> Type approved by DNV. Only approved for multiple installations.	2 135 526
27N	CABLE LENGTH BETWEEN MSB AND SDU			
-00	S Without			
-01	O 3 m		<u>Note!</u> Type approved by DNV.	2 135 526
-02	O 6 m		<u>Note!</u> Type approved by DNV.	2 135 526



Ref	Description	Requirements	Remark	Drw No
27P CABLE LENGTH BETWEEN ENGINE AND SDU				
-00	S Without			
-01	O 3 m		Note! Type approved by DNV.	2 135 526
-02	O 6 m		Note! Type approved by DNV.	2 135 526
EMS PARAMETER SETTINGS				
28A REGULATOR TYPE (EMS parameter setting)				
-01	S RQV Governor (default value)		Note! The accelerator position sensor controls the engine with possible droop. Common for most applications.	
-02	O RQ Governor	Req 28G-00	Note! The accelerator position sensor controls the engine torque/power.	
28B ENGINE TEMP. REACTION (EMS parameter setting)				
<i>High engine temp reaction, 28B-03 to -06, is recommended in applications where the engine is remotely operated</i>				
-01	S Only alarm (default value)		Note!	
-02	O Torque reduction on low limit		• For a classified engine: see applicable classification rules for the intended application.	
-03	O Engine stop on high limit		• Alarm is always included regardless of option.	
-04	O Engine stop on high limit and torque reduction on low limit		• Override possibility refer to engine stop only, not torque reduction	
-05	O Engine stop on high limit (with override possibility)			
-06	O Engine stop on high limit (with override possibility) and torque reduction on low limit			
28C TEMP. LIMIT HIGH (EMS parameter setting)				
<i>This temp. limit decides the engine temp HIGH alarm limit that are described in 28B-.</i>				
-01	O 98°C			
-02	O 100°C			
-03	O 102°C			
-04	O 103°C			
-05	O 104°C			
-06	S 105°C (default value)			
28D TEMP. LIMIT LOW (EMS parameter setting)				
<i>This temp. limit decides the engine temp LOW alarm limit that are described in 28B-.</i>				
-01	S 95°C (default value)			
-02	O 98°C			
-03	O 100°C	Not with 28C-01		
-04	O 103°C	Not with 28C-01, -02 or -03		
28E LOW OIL PRESSURE REACTION (EMS parameter setting)				
<i>Low oil pressure reaction -03 or -04 is recommended in applications where the engine is remotely operated.</i>				
-01	S Only alarm (default value)		Note! For a classified engine: see applicable classification rules for the intended application.	
-02	O Torque reduction, ~30%			
-03	O Engine stop			
-04	O Engine stop with override			



Ref	Description	Requirements	Remark	Drw No
28F	LOW COOLANT LEVEL REACTION (EMS parameter setting)			
Low coolant level reaction -03 or -04 is recommended in applications where the engine is remotely operated. The option is only valid for engines with coolant level sensor, option 25C.				
-00	S Without	Req. 25C-00	Note! For a classified engine: see applicable classification rules for the intended application.	
-01	O Only alarm (default value if 25C-01)	Req. 25C-01		
-02	O Torque reduction, ~30%	Req. 25C-01		
-03	O Engine stop	Req. 25C-01		
-04	O Engine stop with override	Req. 25C-01		
28G	DROOP SETTING (EMS parameter setting)			
Standard setting is recommended for propulsion application, for auxiliary engines powering for example hydraulic pumps the stiff droop is recommended.				
-00	O Without	Req. 28A-02	Note! Speed droop is a concept that describes the change in speed that takes place when loading the engine or when the load is removed.	
-02	S Stiff			
28L	LIMITED HIGH IDLE WHEN COLD ENGINE (EMS parameter setting)			
This function limits the engine speed when the engine is cold, it takes approx 30 seconds before the engine can be revved more than 1000rpm.				
-00	S Without (default value)			
-01	O With			
28M	HIGH IDLE SPEED OFFSET (EMS parameter setting)			
-01	O 4%		Note! Max engine speed is not allowed to exceed 2450 rpm	
-02	O 6%			
-03	O 8%		Example: Engine factory rating + High idle speed offset = Max engine speed 1800 rpm + 16% = 1800 + 288 = 2088 rpm	
-04	S 10% (default value)			
-05	O 12%			
-06	O 14%			
-07	O 16%			
28N	LOW IDLE SPEED (EMS parameter setting)			
The low idle speed is set at such a level that resonance frequencies (critical speeds) in the powertrain are avoided.				
-01	O 500 rpm			
-02	O 550 rpm			
-03	O 600 rpm			
-04	S 650 rpm (default value)			
-05	O 700 rpm			
-06	O 750 rpm			
-07	O 800 rpm			
-08	O 850 rpm			
-09	O 900 rpm			
-10	O 950 rpm			
-11	O 1000 rpm			
-12	O 1050 rpm			



Ref	Description	Requirements	Remark	Drw No
28O	LIMP HOME (EMS parameter setting)			
Important to consider: Is there a risk for injuries of personnel or damages to equipment if the engine runs out of control?				
-01	O Low idle		Settings for how the engine should operate permanently or react due to defect acc. pedal signal or interrupted CAN communication. Note! Ref. 28O-04/05 are intended for customers who wish to connect their own redundant/analogue throttle control directly to the EMS or to engine interface C4002.	
-02	S Incremented low idle ~800 rpm (default value)			
-03	O Shut-off due to CAN defect			
-04	O Redundant throttle (limp home)			
-05	O Redundant throttle always active			
28S	HIGH CHARGE TEMP REACTION			
High charge temp reaction 28S-03 to -06 is recommended in applications where the engine is remotely operated.				
-01	S Only alarm		Note! • For a classified engine: see applicable classification rules for the intended application. • Alarm is always included regardless of option. • Override possibility refer to engine stop only, not torque reduction	
-02	O Torque reduction on low limit			
-03	O Engine stop on high limit			
-04	O Engine stop on high limit and torque reduction on low limit			
-05	O Engine stop on high limit (with override possibility)			
-06	O Engine stop on high limit (with override possibility) and torque reduction on low limit			
45	FLYWHEEL			
-01	S SAE 14			1 925 825
46	FLYWHEEL HOUSING			
-01	S SAE1 flange			1 925 826



Ref	Description	Requirements	Remark	Drw No
49	ENGINE BRACKET			
<i>Main factors to consider when selecting engine suspension are installation height of the engine and forces applied to the engine and driven equipment due to operating conditions. For further information please see the Installation manual.</i> <i>All engine suspensions are available with:</i> - Front-mounted brackets - Front- and rear-mounted brackets or - Front-mounted brackets and prepared for rear-mounted brackets, which means that the surface on the flywheel housing intended for rear-mounted brackets is unpainted.				
-01 S	Fixed low 120 mm below the crankshaft		Front-mounted brackets	1 866 025
-01Z O	Fixed low 120 mm below the crankshaft		Front-mounted brackets. Prepared for rear-mounted brackets.	1 866 025
-02A O	Fixed low 120 mm below the crankshaft		Front- and rear-mounted bracket	1 866 025
-03 O	Power pack type 230 mm below the crankshaft		Front-mounted brackets	1 858 891
-03Z O	Power pack type 230 mm below the crankshaft		Front-mounted brackets. Prepared for rear-mounted brackets.	1 858 891
-04 O	Power pack type 230 mm below the crankshaft		Front- and rear-mounted brackets	1 858 891
-09 O	Fixed extra low 25 mm above the crankshaft		Front-mounted brackets	1 866 025
-09Z O	Fixed extra low 25 mm above the crankshaft		Front-mounted brackets. Prepared for rear-mounted brackets.	1 866 025
-10 O	Fixed extra low 25 mm above the crankshaft		Front- and rear-mounted bracket	1 866 025
49A	ENGINE SUSPENSION			
-00 S	Without			
-01 O	Stiff rubber suspension	Not with 49-02A, -04 or -10	Front	1 866 025
-02 O	Stiff rubber suspension	Req. 49-02A, -04 or -10	Front and rear	1 866 025
51	AIR CLEANER			
<i>The selection of air cleaner is dependent on the concentration of dust in the air that surrounds the engine. Light duty is suitable for applications working in low dust environment, ocean going. Medium duty is suitable for applications in dusty environments like river boats where dust from land easily can be carried to the vessel.</i>				
-01A S	Prepared			
-05 O	Light duty, Ø15".		Separately. Without hose.	1 925 175
-08 O	Medium duty, Ø15" incl. safety element and pre-cleaner.		Separately. Without hose.	1 925 176
-10 O	Light duty, Ø8"		Mounted on turbo charger	1 529 410
56	EXHAUST BEND			
-01 S	Without, but with turbo-mounted flange	Req. 57-00		2 127 364
-02 O	90° bend, adjustable direction	Req. 57-02, -03, -05 or -06		2 127 364
-06 O	Water cooled, 90° bend, pointing rearwards	Req. 57-00	Note! Only for engines with heat exchanger	2 033 702



Ref	Description	Requirements	Remark	Drw No
57	EXHAUST FITTINGS			
-00	S Without			
-02	O Flange, Ø130 mm			2 127 364
-03	O Flange, Ø155 mm			2 127 364
-05	O Compensator and flange, Ø130 mm			2 127 364
-06	O Compensator and flange, Ø155 mm			2 127 364
60	OIL SUMP			
-01	S Deep front oil sump			2 134 590
-02	O Low oil sump			1 927 084
60A	OIL DIPSTICK			
-01	S Short, left hand side, in block			2 127 354
-02	O Long, left hand side, rear in block	Req. 61-05B		2 127 354
60B	ENGINE OIL, FACTORY FILLED			
<i>The engine can be delivered with factory filled engine oil. This option is suitable for customers that are interested in reducing or eliminating the handling of oil in their production process.</i> <i>Engine oil: Scania LDF-3. Viscosity class: 10W-40. Outside temperature: -20°C - >+30°C.</i>				
-00	S Without			
-01	O For deep front oil sump	Req. 60-01		
-03	O For low oil sump	Req. 60-02		
61	OIL FILLER			
-01A	S In engine block, left hand side	Req. 60A-01		2 127 354
-01B	O In valve cover, cyl 1, and engine block, left hand side	Req. 60A-01		2 127 354
-05B	O In valve cover, cyl 1, and engine block, rear left hand side	Req. 60A-02		2 127 354
62	OIL DRAINING			
<i>The selection of oil draining is dependent on the installation. Especially critical is the space available below and next to the oil drain plug. If space for a drain bucket is available, then the standard oil plug is preferred as a simple solution. The hand pump, or electrical pump, is used if the oil is drained to a level above the engine.</i>				
-01	S With plug			2 134 590
-02	O With valve	Req. 60-01		2 012 121
-03	O With hand pump, right hand side		Delivered loose	1 859 126
-04	O With hand pump, left hand side	Req. 60-01	Delivered loose	1 859 126
-05	O With electric pump and 3-way cock on right hand side		Delivered loose	1 407 848
-06	O With electric pump and 3-way cock on left hand side	Req. 60-01	Delivered loose	1 407 848
65	CRANKSHAFT			
<i>The crankshaft is a part subject to special requirements regarding traceability by the class societies. For approval by specific class societies this might be a requirement, to be checked with the class society.</i>				
-01	S Not classified			
-02	O With 3.1 material certificate			
-03	O Classified by Lloyds Register			
Introduction date to be announced				



Ref	Description	Requirements	Remark	Drw No
78	SEA WATER PUMP			
<i>The self-priming centrifugal seawater pump is suitable for operations in water containing large amounts of sand, mud or solids. The self-priming pump can withstand to be run without water for a short period. Typical operations are river boats in muddy water and rescue boats that may have to enter the shore during operation.</i>				
-00	S Without		Note! Only for engines with keel cooling	
-01	S With		Note! Only for engines with heat exchanger	2 127 357
-02	O With connection hoses		Note! Only for engines with heat exchanger	2 127 357
-03	O With connection tubes		Note! Only for engines with heat exchanger	2 127 357
-11	O Self-priming centrifugal pump	Req. 78B-01	Note! Only for engines with heat exchanger	2 127 357
-12	O Self-priming centrifugal pump with hose connection	Req. 78B-01	Note! Only for engines with heat exchanger	2 127 357
-13	O Self-priming centrifugal pump with tube connection	Req. 78B-01	Note! Only for engines with heat exchanger	2 127 357
78A	BILGE PUMP			
-00	S Without			
-01	O With one bilge pump	Req. 90-00 Not with 49-03,-03Z or -04		1 866 350
-02	O With two bilge pumps	Req. 90-00 Not with 49-03,-03Z or -04	For example to be used as one bilge pump and one flush pump.	1 866 350
78B	SEA WATER PUMP POSITION			
<i>For SAE B rear high position there is a risk for interference with large transmission housings or generators. In order to avoid interference in these cases SAE B low rear pointing forward is recommended.</i>				
-00	S Without		Note! Only for engines with keel cooling	
-01	S SAE B high rear		Note! Only for engines with heat exchanger	2 127 357
-02	O SAE B low rear pointing forward	Req. 96A-00	Note! Only for engines with heat exchanger	2 127 357
90	FRONT-MOUNTED POWER TAKE-OFF (PTO)			
<i>A front-mounted PTO is suitable for applications that need high torques, for example large auxiliary pumps and air compressors. Normally the driven equipment is mounted separate from the engine.</i>				
-00	S Without			
-01	O Stub shaft for connection of flexible coupling. Max torque 800 Nm			1 883 974
-02	O Crankshaft pulley with two extra grooves, Ø260 mm			1 883 974
-03	O Stub shaft for connection of flexible coupling with crankshaft pulley with two extra grooves, Ø260 mm			1 883 974
-04	O Crankshaft pulley with three extra grooves, Ø260 mm			1 883 974
-07	O Stub shaft for connection of flexible coupling with crankshaft pulley with three extra grooves, Ø260 mm			1 883 974



Ref	Description	Requirements	Remark	Drw No
91	SIDE-MOUNTED POWER TAKE-OFF (PTO)			
A side-mounted PTO is used for low rated engine-mounted hydraulic pumps or compressors.				
-00	S Without			
-01	O Prepared for SAE B	Req. 78B-00 or -02		
-02	O SAE B, 2-hole, 13 teeth. Gear ratio 1:1.19. Pointing backwards.	Req. 78B-00 or -02	Note! Max torque 250 Nm (continuous) Max torque 400 Nm (intermittent)	1 448 964
-03	O SAE A, 2-hole, 9 teeth. Gear ratio 1:1.71. Pointing backwards.	Req. 93-00	Note! Max torque 100 Nm (continuous) Max torque 125 Nm (intermittent)	1 798 247
-04	O SAE A and SAE B	Req. 78B-00 or -02 Req. 93-00		
-05	O SAE B, 2-hole, 13 teeth. Gear ratio 1:1.19. Low, pointing forward.	Req. 78B-00 or -01		1 945 647
-08	O SAE A and SAE B low, pointing forward	Req. 78B-00 or -01 Req. 93-00		
92A	AC COMPRESSOR			
-00	S Without			
-01	O With	Req. 25E-01		
93	HYDRAULIC PUMP			
-00	S Without			
-01	O Capacity 16 l/min at 170 bar intermittent, 25-30 bar continuous		Note! Without pressure reduction valve	1 757 131 1 449 167
-02	O Capacity 25 l/min at 170 bar intermittent, 25-30 bar continuous		Note! Without pressure reduction valve	1 757 131 1 449 167
96C	STUDS IN FLYWHEEL HOUSING			
-00	S Without			
-01	O With			
98C	FUEL PRE-FILTER			
Fuel pre-filter is required for all Scania marine engines. Water will condensate in the tank and enter the fuel, thus a risk of engine disturbances. The fuel pre-filter separates water from the fuel. The option without is valid for customers who uses a non-Scania pre-filter.				
-00	O Without		Note! 98C-00 requires a water separating pre-filter from an external manufacturer. If no filter is mounted the engine warranty is not valid.	
-01	S Single fuel filter with water separator	Req. 10M-00	Note! Not type approved by any classification society.	1 774 501
-03	O Reversible dual fuel filter with water separator		Note! Type approved by ABS and BV.	1 769 500
98D	CAB HEATER			
-00	S Without			
-01	O Prepared for cab heater connection front			
-02	O Prepared for cab heater connection rear			
99G	PAINTWORK			
-01	S Orange heavy duty quality / silver on warm parts			



Ref	Description	Requirements	Remark	Drw No
99L	CRANKCASE VENTILATION			
-01	S Closed ventilation			1 866 026
99P	OPERATOR'S MANUAL			
-00	O Without		Note! If a preferred language is not specified when ordering, the operator's manual will be delivered in English. Available languages are: Chinese (simplified), Chinese (trad.), Czech, Danish, Dutch, English, Finnish, French, German, Italian, Japanese, Korean, Norwegian, Polish, Portuguese, Russian, Spanish and Swedish	
-01	S 1 copy			
-02	O 2 copies			
-03	O 3 copies			
99Q	SPARE PARTS CATALOGUE			
-00	S Without			
-01	O 1 copy			
-02	O 2 copies			
-03	O 3 copies			
99T	FUEL MAIN FILTER			
<i>Reversible fuel filters enable the switching of fuel filters during operation. This is required by classification societies in many applications.</i>				
-00	S Single fuel filter			
-01	O Reversible dual fuel filter		Note! Approved for classification.	
99U	FUEL HOSES			
-00	O Without			
-01	S With nipples			
-02	O With two fuel hoses			



4 ENGINE DATA 9-series

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General information

Standard equipment

Scania Engine Management System, EMS

Unit injectors, PDE

Turbocharger

Water-cooled charge air cooler

Fuel pre-filter with water separator

Fuel filter

Oil filter, full flow

Centrifugal oil cleaner

Oil cooler, integrated in block

Oil filler, in engine block

Oil draining with plug

Oil dipstick, in block

Starter, 2-pole, 7.0 kW, (EMS controlled)

Alternator 2-pole, 100A

Flywheel SAE 14

Silumin flywheel housing, SAE1 flange

Front-mounted engine brackets

Protection covers

Sea water pump (engines with heat exchanger only)

Heat exchanger with expansion tank (engines with heat exchanger only)

Closed crankcase ventilation

Operator's manual

For optional equipment, see 'Equipment list'.

Note! No optional equipment is type approved for classification if not otherwise stated.

Ratings

PRP, Prime power For continuous operation and unlimited yearly operation at varying load. Max. mean load factor of 70% of rated power over 24 h of operation.
1 hour/12 hours period of accumulated peak overload to 110%.

Power definition acc. to ISO 8528.

Power test codes: ISO 3046, ISO 8528, DIN 6280 Dauerbetrieb.

Emission compliance and classification

For detailed information about approved and certified engines and classification society approvals, access SAIL at <http://sail.scania.com> to view or download the appropriate certificate.

Dual speed configuration

The engine speed can be switched between 1500 rpm (50 Hz) and 1800 rpm (60 Hz) via the Coordinator/EMS.

Note! that the default setting is 1500 rpm (50 Hz) from factory.

To manually change the nominal speed, see Electrical systems in the Installation manual or EMS CAN specifications on SAIL at <http://sail.scania.com>.



Engine programme

EU Stage IIIA¹ and IMO Tier II compliant engines

Preliminary start of engine deliveries: September 2013

With heat exchanger

Engine type	1500 rpm (50Hz)	1800 rpm (60Hz)	Factory order reference sequence			
	PRP	PRP				
	kW	kW	Rating	Engine speed	Output	Engine ref.
DI09 074M	199	199	13-03	35-20	12-71	04-01
DI09 074M	217	217	13-03	35-20	12-72	04-02
DI09 074M	269	269	13-03	35-20	12-50	04-03
DI09 074M	269	323	13-03	35-20	12-73	04-04

4_B

With keel cooling

Engine type	1500 rpm (50Hz)	1800 rpm (60Hz)	Factory order reference sequence			
	PRP	PRP				
	kW	kW	Rating	Engine speed	Output	Engine ref.
DI09 074M	199	199	13-03	35-20	12-71	04-11
DI09 074M	217	217	13-03	35-20	12-72	04-12
DI09 074M	269	269	13-03	35-20	12-50	04-13
DI09 074M	269	323	13-03	35-20	12-73	04-14

1) EU Stage IIIA only applies for propulsion engines with E2 test cycle.



Basic data

General

Configuration and number of cylinders	5 in-line	
Working principle	4-stroke	
Bore x stroke	130 x 140	mm
Displacement	9.3	dm ³
Compression ratio	18:1	
Firing order	1 - 2 - 4 - 5 - 3	
Piston speed		
at 1500 rpm	7.0	m/s
at 1800 rpm	8.4	m/s
Pistons	Aluminum pistons	
Camshaft	High position alloy steel	
Connection rods	I-section press forgings of alloy steel	
Crankshaft	Alloy steel with hardened and polished bearing surfaces	
Rotation, seen from flywheel end	Counter clockwise	
Total moment of inertia with flywheel		
SAE 14	2.63	kgm ²
Number of teeth on flywheel ring gear	158	
Weight approx. (excl. oil and coolant)		
with heat exchanger	1150	kg
with keel cooling	1044	kg

Lubrication system

Oil capacity (standard oil sump)		
min	32	dm ³
max	38	dm ³
Oil consumption	<0.2	g/kWh
Oil change intervals	500	h
Oil grade		
engines run on low-sulphur fuel	ACEA E5 or E7	
engines not run on low-sulphur fuel	Total Base Number (TBN) at least 12 (ASTM 2896)	
Oil pressure		
normal	3-6	bar
minimum permitted at idle speed	0.7	bar
Oil temperature		
normal	90-110	°C
Oil cleaner	Centrifugal	
filtration	5-7	Micron
Oil filter	Paper/Full flow	
Oil cooler	Water cooled/Full flow	

Injection system

Type	Unit injectors
Governor	Scania Engine Management System, EMS
Fuel filter	Paper filter element

**Cooling system**

Coolant volume

with heat exchanger	30	dm ³
with keel cooling	23	dm ³

Coolant temperature

with heat exchanger	90-95	°C
with keel cooling	83-88	°C

Number of thermostats..... 1

Opening temperature

with heat exchanger	80/87	°C
with keel cooling	75	°C

Intake system

Permissible pressure drop in intake system

with cleaned or new filter.....30 mbar

Permissible pressure drop in intake system

with blocked (dirty) filter65 mbar

Electrical system

Type2-pole, 24V, DC

Starter, standard equipment.....2-pole, 24V, 7.0 kW

Alternator, standard equipment 2-pole, 28V, 100A



Technical data

DI09 074M, 199 kW - With heat exchanger (engine ref. 04-01)

DI09 074M, 199 kW - With keel cooling (engine ref. 04-11)

Emission compliance	Fuel injection system	Rating
EU Stage IIIA ¹⁾ and IMO Tier II	Unit injectors, PDE	PRP, Prime power

	Engine speed (rpm)		Unit
	1500	1800	
Gross power	199	199	kW
Gross torque	1267	1056	Nm
Spec. fuel consumption			
full load	194	200	g/kWh
3/4 load	198	205	g/kWh
1/2 load	207	218	g/kWh
Heat rejection			
to coolant*	144	152	kW
to main coolant circuit**	118	121	kW
to charge air cooler circuit**	26	31	kW
to exhaust gas	114	118	kW
to surrounding air	9	9	kW
Coolant flow @ back pressure in water circuit for charge air cooler**	210@0.36	250@0.50	dm ³ @bar
Max. water inlet temp. to charge air cooler**	38	38	°C
Air consumption	17	20	kg/min
Air temperature			
before charge air cooler**	134	134	°C
after charge air cooler**	40	40	°C
Pressure in intake manifold	1.3	1.3	Bar
Exhaust flow	17	20	kg/min
Exhaust temperature	392	355	°C

* For engines with heat exchanger

** For engines with keel cooling

1) EU Stage IIIA only applies for propulsion engines with E2 test cycle.

Technical data

DI09 074M, 217 kW - With heat exchanger (engine ref. 04-02)

DI09 074M, 217 kW - With keel cooling (engine ref. 04-12)

Emission compliance	Fuel injection system	Rating
EU Stage IIIA ¹⁾ and IMO Tier II	Unit injectors, PDE	PRP, Prime power

	Engine speed (rpm)		Unit
	1500	1800	
Gross power	217	217	kW
Gross torque	1381	1151	Nm
Spec. fuel consumption			
full load	193	200	g/kWh
3/4 load	197	203	g/kWh
1/2 load	205	214	g/kWh
Heat rejection			
to coolant*	155	161	kW
to main coolant circuit**	125	130	kW
to charge air cooler circuit**	30	31	kW
to exhaust gas	123	133	kW
to surrounding air	10	10	kW
Coolant flow @ back pressure in water circuit for charge air cooler**	210@0.36	250@0.50	dm ³ @bar
Max. water inlet temp. to charge air cooler**	38	38	°C
Air consumption	18	20	kg/min
Air temperature			
before charge air cooler**	143	135	°C
after charge air cooler**	41	41	°C
Pressure in intake manifold	1.5	1.3	Bar
Exhaust flow	18	20	kg/min
Exhaust temperature	400	392	°C

* For engines with heat exchanger

** For engines with keel cooling

4B

1) EU Stage IIIA only applies for propulsion engines with E2 test cycle.



Technical data

DI09 074M, 269 kW - With heat exchanger (engine ref. 04-03)

DI09 074M, 269 kW - With keel cooling (engine ref. 04-13)

Emission compliance	Fuel injection system	Rating
EU Stage IIIA ¹⁾ and IMO Tier II	Unit injectors, PDE	PRP, Prime power

	Engine speed (rpm)		Unit
	1500	1800	
Gross power	269	269	kW
Gross torque	1713	1427	Nm
Spec. fuel consumption			
full load	196	199	g/kWh
3/4 load	194	200	g/kWh
1/2 load	200	207	g/kWh
Heat rejection			
to coolant*	188	193	kW
to main coolant circuit**	154	155	kW
to charge air cooler circuit**	34	38	kW
to exhaust gas	164	168	kW
to surrounding air	13	13	kW
Coolant flow @ back pressure in water circuit for charge air cooler**	210@0.36	250@.050	dm ³ @bar
Max. water inlet temp. to charge air cooler**	38	38	°C
Air consumption	19	21	kg/min
Air temperature			
before charge air cooler**	152	151	°C
after charge air cooler**	42	43	°C
Pressure in intake manifold	1.6	1.5	Bar
Exhaust flow	19	22	kg/min
Exhaust temperature	483	441	°C

* For engines with heat exchanger

** For engines with keel cooling

1) EU Stage IIIA only applies for propulsion engines with E2 test cycle.



Technical data

DI09 074M, 269-323 kW - With heat exchanger (engine ref. 04-04)

DI09 074M, 269-323 kW - With keel cooling (engine ref. 04-14)

Emission compliance	Fuel injection system	Rating
EU Stage IIIA ¹⁾ and IMO Tier II	Unit injectors, PDE	PRP, Prime power

	Engine speed (rpm)		Unit
	1500	1800	
Gross power	269	323	kW
Gross torque	1713	1714	Nm
Spec. fuel consumption			
full load	196	205	g/kWh
3/4 load	194	199	g/kWh
1/2 load	200	203	g/kWh
Heat rejection			
to coolant*	188	233	kW
to main coolant circuit**	154	189	kW
to charge air cooler circuit**	34	44	kW
to exhaust gas	164	224	kW
to surrounding air	13	16	kW
Coolant flow @ back pressure in water circuit for charge air cooler**	210@0.36	250@0.50	dm ³ @bar
Max. water inlet temp. to charge air cooler**	38	38	°C
Air consumption	19	22	kg/min
Air temperature			
before charge air cooler**	152	164	°C
after charge air cooler**	42	45	°C
Pressure in intake manifold	1.6	1.7	Bar
Exhaust flow	19	24	kg/min
Exhaust temperature	483	537	°C

* For engines with heat exchanger

** For engines with keel cooling

4B

1) EU Stage IIIA only applies for propulsion engines with E2 test cycle.



Basic dimensions

The basic dimensions are indicated with coordinates. The coordinate system is three dimensional and consists of three planes at straight angles to each other; x, y and z. The dimensions are indicated in mm from crankshaft centre.

DI09 074M - With heat exchanger

1 Air intake (Ø 150 mm)

1	x	+201
	y	-141
	z	+517

2 Exhaust outlet (Ø 117.35 mm)

2	x	-14
	y	+269
	z	+517

3 Sea water inlet (Ø 50 mm)

3	x	+2
	y	+284
	z	+146

4 Sea water outlet (Ø 50 mm)

4	x	-429
	y	+374
	z	+315

5 Coolant drain (fresh water)

6 Fresh water filling

7 Fuel inlet (union nut M16x1.5)

7	x	-493
	y	-280
	z	+131

8 Fuel return (union nut M16x1.5)

8	x	-543
	y	-280
	z	+131

9 Oil filling in valve cover
(optional position)

10 Oil filling/dipstick

11 Oil drain plug

12 Connection from cab heater (M22x1.5)

12	x	-852
	y	+347
	z	+90

13 Connection to cab heater (M18x1.5)
(remove lid to access)

13	x	-1065
	y	+108
	z	+396

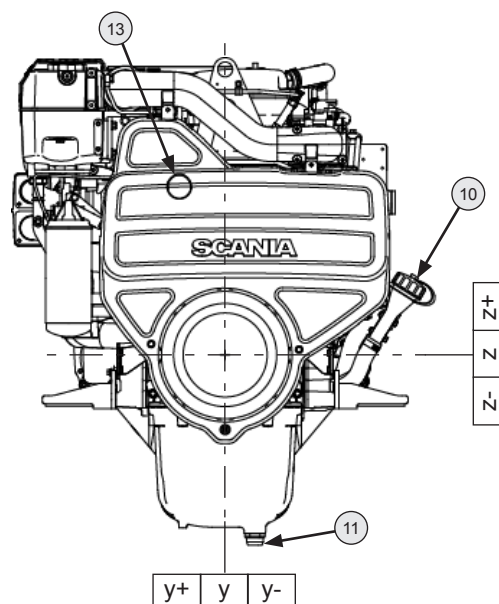
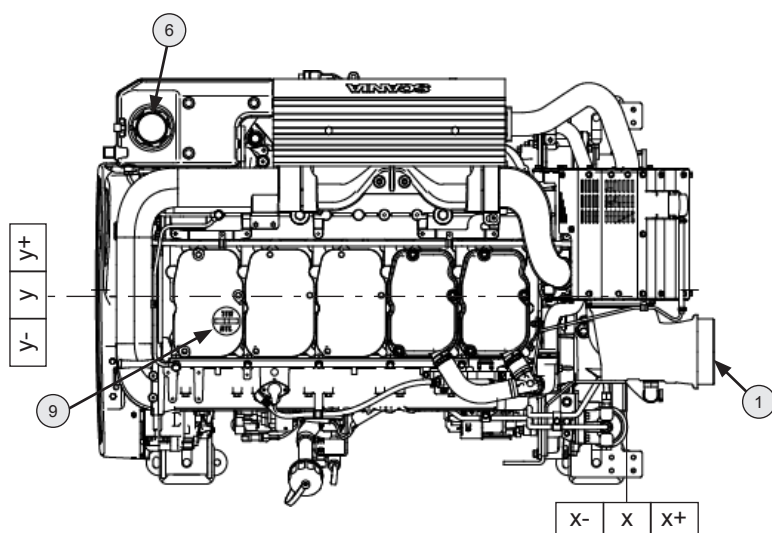
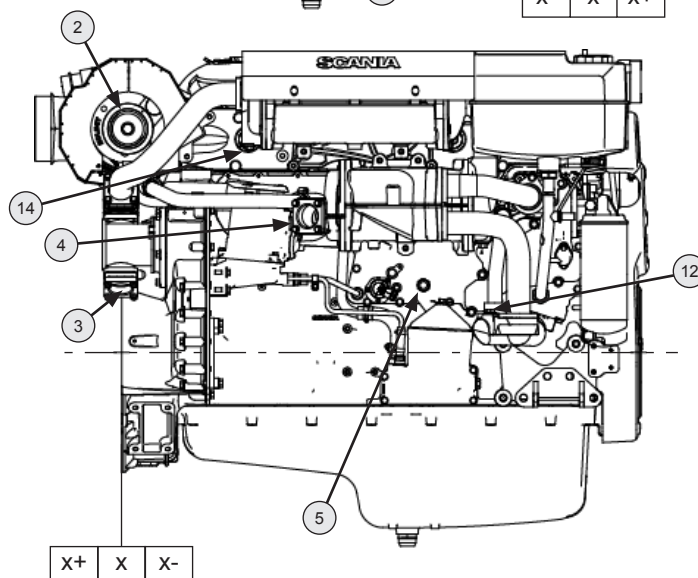
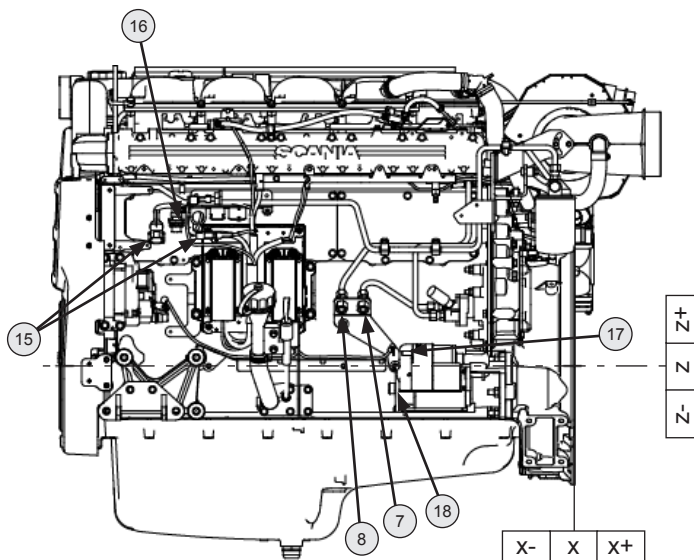
14 Sacrificial anode (2x)

15 Customer interface EMS

16 Diagnostic socket

17 Battery connection + (M10)

18 Battery connection - (M12)



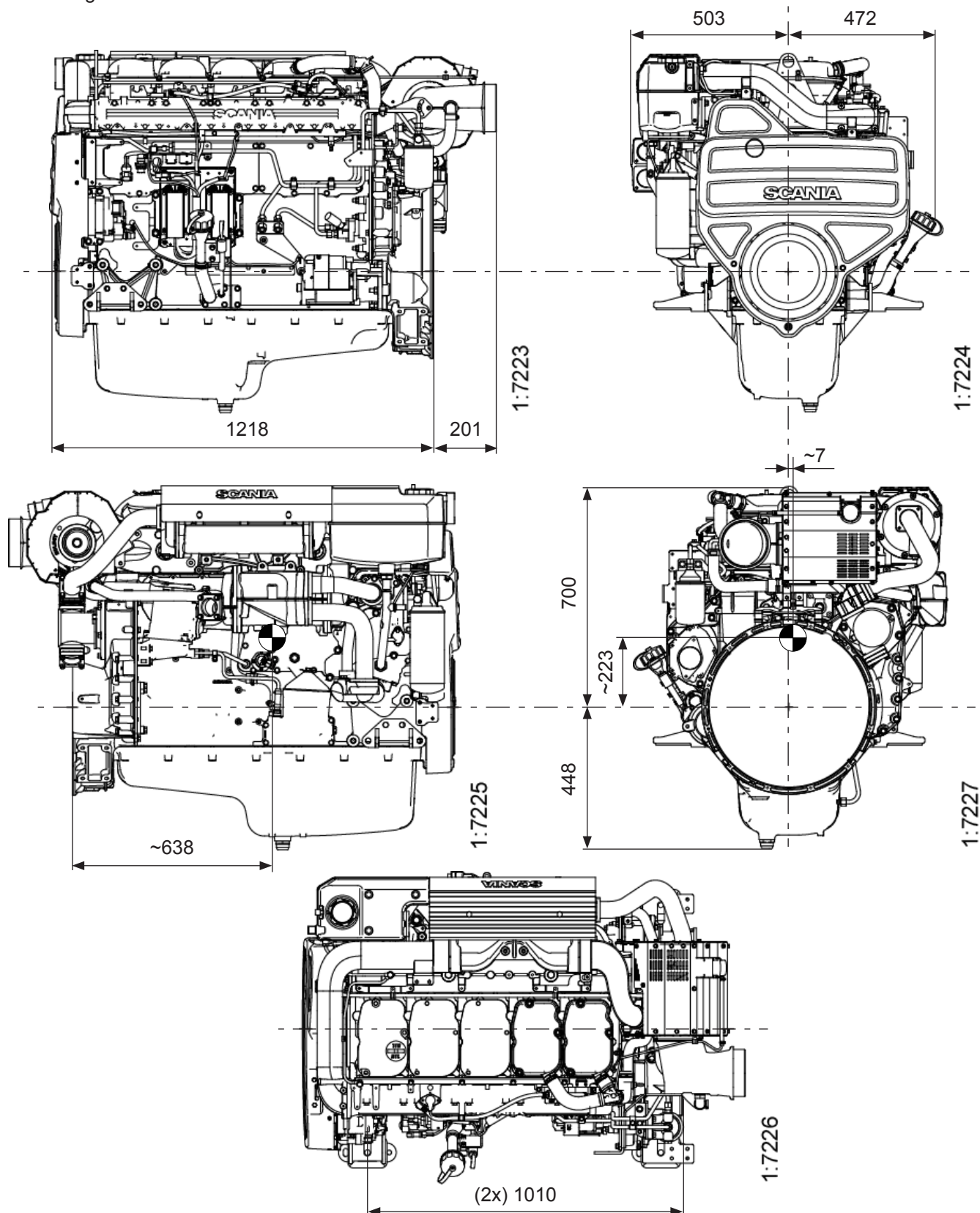


Dimensional drawings

All sketches are only intended as general sales information and must not be used for any installation purposes. The values for centre of gravity applies for engines with standard equipment including coolant. All dimensions are indicated in mm.

DI09 074M - With heat exchanger

Drawing no 2 134 590



4B



Basic dimensions

The basic dimensions are indicated with coordinates. The coordinate system is three dimensional and consists of three planes at straight angles to each other; x, y and z. The dimensions are indicated in mm from crankshaft centre.

DI09 074M - With keel cooling, double circuit

- 1 Air intake (Ø 150 mm)

1	x	+201
	y	-141
	z	+517

- 2 Exhaust outlet (Ø 117.35 mm)

2	x	-14
	y	+269
	z	+517

- 3 Main coolant inlet (Ø 63 mm)

3	x	-917
	y	+505
	z	+220

- 4 Main coolant outlet (Ø 63 mm)

4	x	-1193
	y	+430
	z	+382

- 5 Coolant drain/filling (fresh water)

- 6 Fuel inlet (union nut M16x1.5)

6	x	-493
	y	-280
	z	+131

- 7 Fuel return (union nut M16x1.5)

7	x	-543
	y	-280
	z	+131

- 8 Oil filling in valve cover (optional position)

- 9 Oil filling/dipstick

- 10 Oil drain plug

- 11 Connection from cab heater (M22x1.5)

11	x	-852
	y	+347
	z	+90

- 12 Connection to cab heater (M18x1.5)
(remove lid to access)

12	x	-1065
	y	+108
	z	+396

- 13 Customer interface EMS

- 14 Diagnostic socket

- 15 Battery connection + (M10)

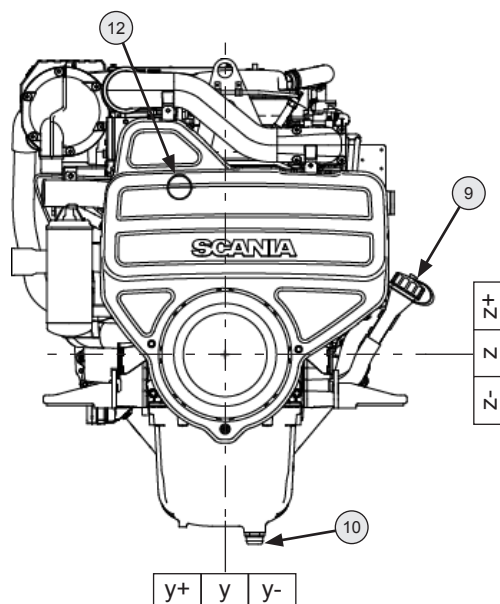
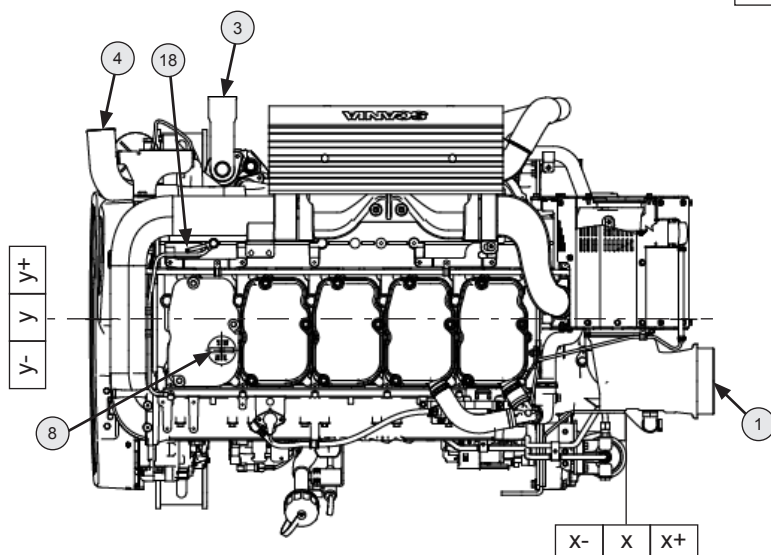
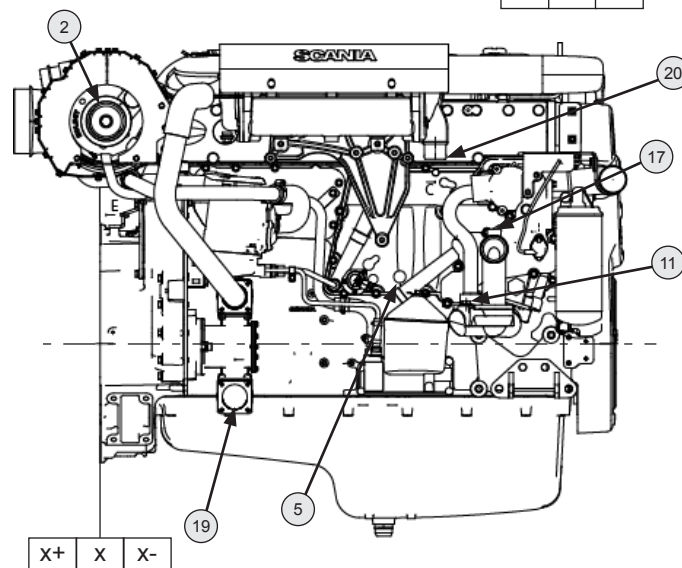
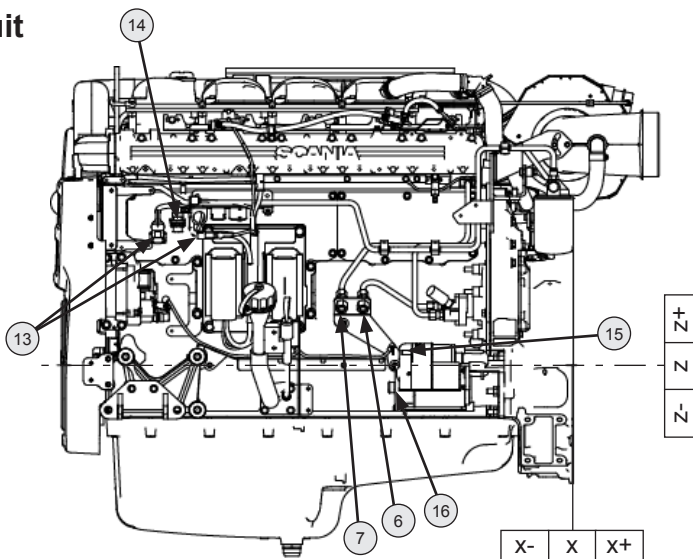
- 16 Battery connection - (M12)

- 17 Static line (Ø 32 mm)

- 18 Coolant bleed pipe (Ø 8 mm)

- 19 Coolant inlet from CAC external circuit (Ø 54 mm)

- 20 Coolant outlet to CAC external circuit (Ø 54 mm)



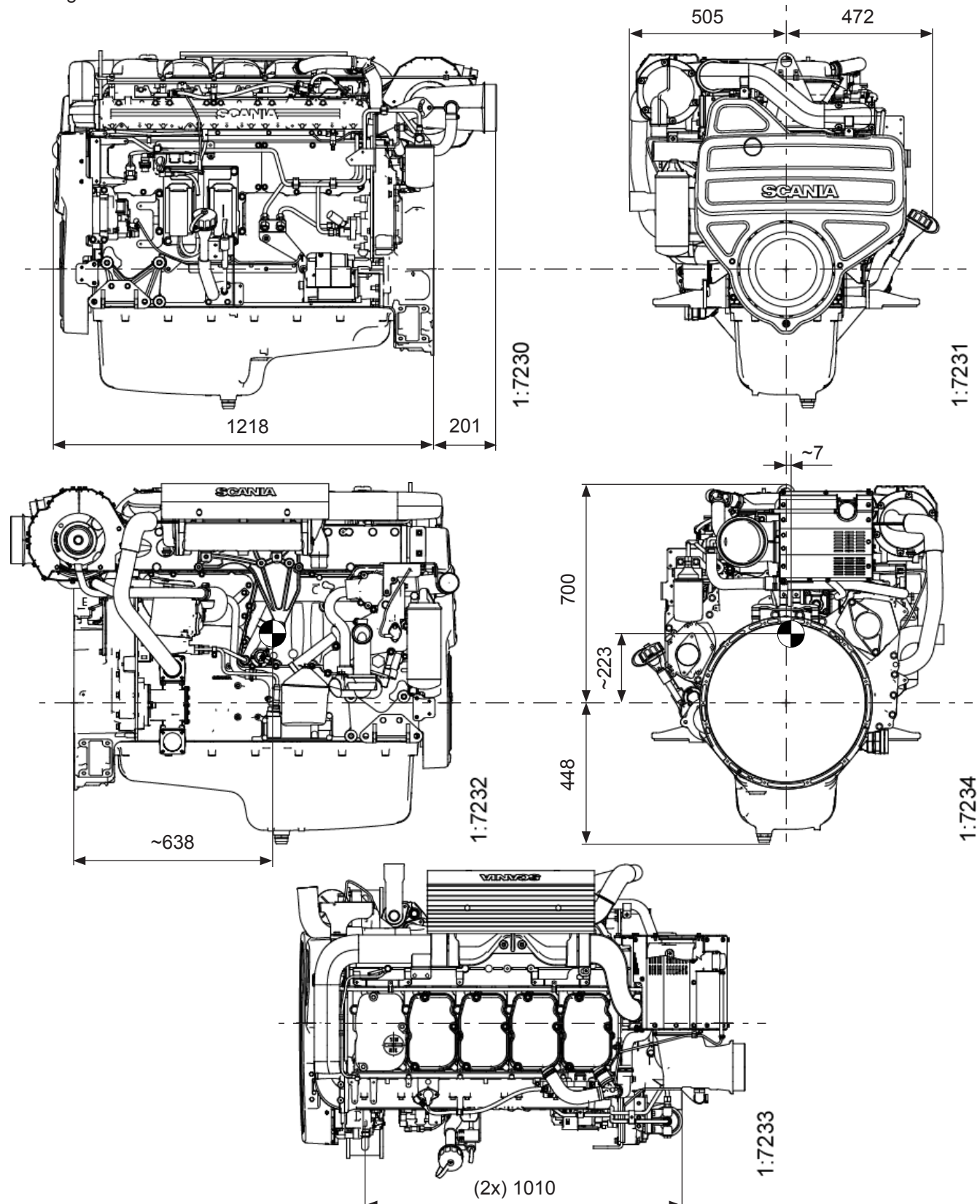


Dimensional drawings

All sketches are only intended as general sales information and must not be used for any installation purposes. The values for centre of gravity applies for engines with standard equipment including coolant. All dimensions are indicated in mm.

DI09 074M - With keel cooling, double circuit

Drawing no 2 134 591

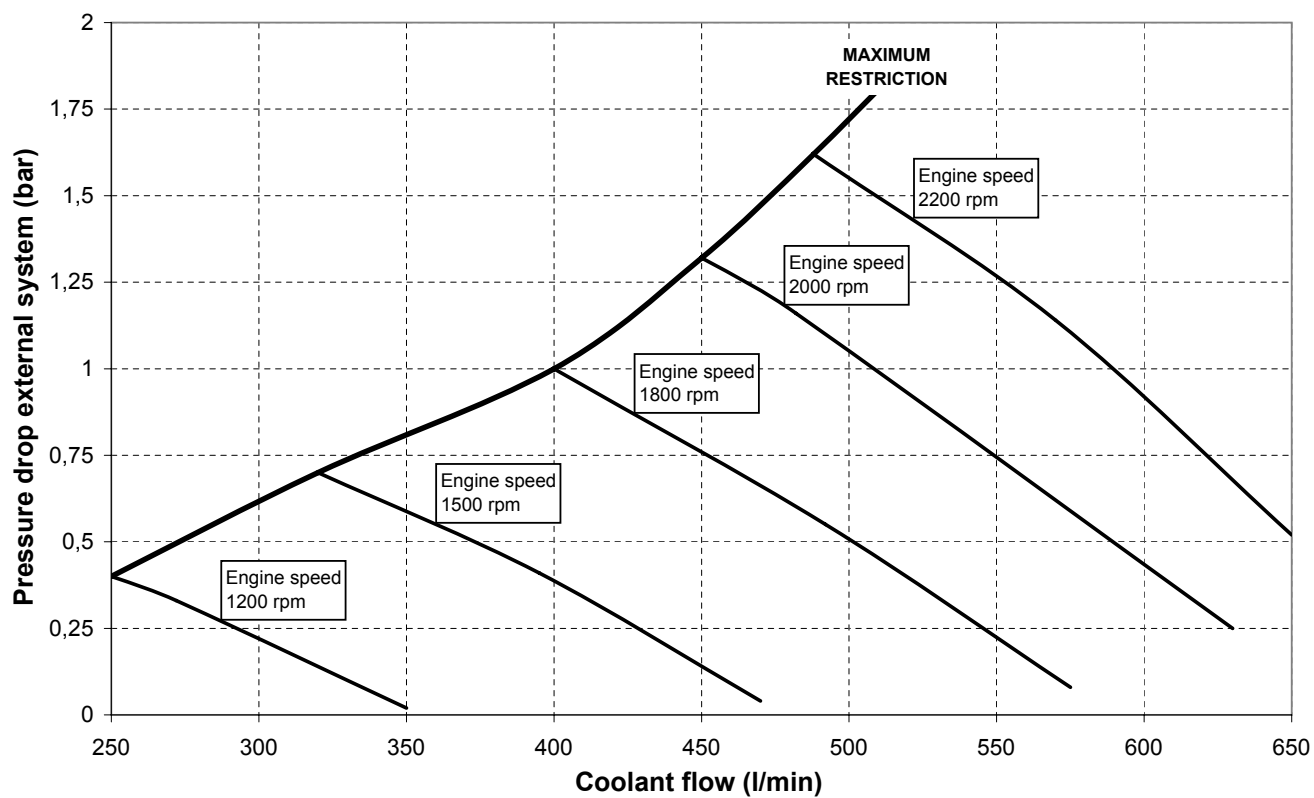


4_B



Coolant flow

The coolant flow depends on the pressure drop in the external system according to the graph below.
Valid for all DI09.





Equipment list

S = Standard

O = Optional

For illustrations and technical data, please see 'Equipment data'.

Drawings referred to in this section are available on Scania's Technical Information Library, TIL, under 'Drawings industrial & marine engines' or can be ordered via Pre-sales FRAS.

Ref	Description	Requirements	Remark	Drw No
10K	TORSIONAL VIBRATION CALCULATIONS			
-00	S Without			
-01	O Single engine installation with 1-3 driven masses. Typical genset or direct driven propeller installations.		Note! TVC can not be ordered directly.	
-02	O Several driven masses both behind and/or in front of the engine. Genset with auxiliary devices, propeller installations with front PTO, propeller installations with marine transmissions.		Torsional vibration calculations must be requested with the TVC form available at https://sail.scania.com and sent to factory for evaluation, before an actual order can be placed.	
-03	O Branched drive train, multi engine (advanced) installations, belt driven units etc.		If a TVC calculation has been rejected, further investigation is possible and will be charged per hour.	
10M	CLASSIFICATION			
	Note! For information about approved engines, access SAIL at http://sail.scania.com .			
-00	S Without			
-01	O ABS: American Bureau of Shipping	Req. 65-03		
-02	O BV: Bureau Veritas	Req. 65-02 or -03		
-03	O DNV: Det Norske Veritas	Req. 65-02 or -03		
-04	O GL: Germanischer Lloyd	Req. 65-02 or -03		
-05	O LR: Lloyds Register	Req. 65-03		
-06	O RINA: Registro Italiano Navale	Req. 65-03		
-11	O SF: Sjöfartsverket			
-12	O RS: Russian Maritime Register of Shipping	Req. 65-02 or -03		
-13	O RRR: Russian River Register			
-14	O CCS: China Classification Society	Req. 65-02 or -03		
-15	O TL: Türk Loydu	Req. 65-03		
-16	O CRS: Croatian Register of Shipping	Req. 65-02 or -03		



Ref	Description	Requirements	Remark	Drw No
100	TYPE OF IMO CERTIFICATE			
	Note! Ships in Russia: All engines above 130 kW on vessels with flag state Russia, except emergency engines, must have EIAPP certificate issued by Russian Maritime Register of Shipping, 10O-05. Note! Ships in China: All engines above 130 kW on vessels with flag state China, except emergency engines, must have EIAPP certificate issued by China Classification Society, 10O-06. Note! EIAPP for German-flagged vessels will have an additional fee due to extra costs caused by the German Administration.			
-00	S	Without		
-01	O	EIAPP certificate issued by Germanischer Lloyd - GL		
-02	O	S.o.C certificate issued by Germanischer Lloyd - GL		
-05	O	EIAPP certificate issued by Russian Maritime Register of Shipping - RS	Req. 10M-12	No EIAPP certificate will be issued if the engine is not classified by RS.
-06	O	EIAPP certificate issued by China Classification Society - CCS	Req. 10M-14	No EIAPP certificate will be issued if the engine is not classified by CCS.
25A	CONNECTION EMS			
	The connector kit contains pins and connector for connecting to the electrical interface on the engine. The customer will attach the wirings to the connectors himself.			
-01	S	With connector kit		
-02	O	With cable 6.3 m incl. connector		
25B	OIL TEMP, Integrated oil temp. sensor			
-00	S	Without		
-01	O	With		
25C	COOLANT LEVEL MONITOR			
	The coolant level monitor is used to ensure that the coolant level is not dropping below a critical level that leaves the temperature sensor in the air. If the temperature sensor is not in contact with the coolant, boiling will not be detected, causing a risk for engine damages. The coolant level monitor is strongly recommended since the engine room is mostly remote operated.			
-00	S	Without	Note! Requires a level monitor from an external manufacturer.	
-01	O	Level monitor 2-pole, normally closed (when mounted in application)	Req. 28F-01, -02, -03 or -04	
25D	STARTER			
-00AO		Without		
-01	S	2-pole, 7kW		1 882 043
25E	ALTERNATOR			
	In the selection of an alternator the total electrical consumption must be considered. It is essential that a reserve of electrical power is available in order to avoid voltage drop in the EMS and problems with equipment such as instrumentation and lighting.			
-00AO		Without		
-01	S	2-pole, 100A		1 743 548
-04	O	2-pole, 2 x 100A		1 743 548



Ref	Description	Requirements	Remark	Drw No
25F	ENGINE HEATER			
The engine heater will ensure that the engine keeps a temperature level above the ambient for easier starting. Since a warm engine have less friction, emission and operates more smoothly due to warm oil it will be more environmental friendly and significantly reduce engine wear. Engine heater 1500W with thermostat is recommended for customers that will use the heater continuously. Engine heater 500W is recommended for installations with insufficient fusing for using 1500W.				
-00	S Without			
-01	O 1500 W/230 V, plug in type		Only for engines with keel cooling and engines without heat exchanger and water-cooled CAC	1 722 729
-06	O 1500 W/115 V, plug in with thermostat			2 074 315
-07	O 1500 W/230 V, plug in with thermostat			2 074 315
-08	O 550 W/230 V, plug in with thermostat			2 074 315
-09	O 550 W/115 V, plug in with thermostat			2 074 315
25G	POWER CABLE BETWEEN ALTERNATOR AND STARTER			
The power cable is the feeding cable from the alternator to the starter motor for charging the batteries. The cable is mandatory to have either supplied by Scania or by the customer. The alternator requires constant 24V connected at B+ in order to work correctly.				
-00	O Without			
-01AS	With, for single alternator configuration	Req. 25E-01	Note! The power cable is non-fused and not approved for classification.	
-02	O With, for double alternator configuration	Req. 25E-04		
25H	OIL LEVEL SENSOR			
The oil level sensor enables the engine operator to electronically read the level of oil in the engine as a part of the daily inspection. It is a complement to oil dipstick. The signal must be taken care of by the customer directly from the sensor.				
-00	S Without			
-02	O With, but without electrical connection (connected and monitored by customer)	Req. 60-01		1 891 846
26A	FINE TUNE POTENTIOMETER			
-00	S Without		Note! This option is not approved for integration in a classified electrical monitoring system	
-01	O With	Req. 26B-01 or -02		
26B	COORDINATOR			
The coordinator will enable communication between the engine and other equipment by converting digital CAN signals into analogue signals.				
-00	S Without			
-01	O With, incl. connector kit	Req. 26K-01, -02, -03 or -04	Note! This option is not approved for integration in a classified electrical monitoring system	1 793 627
-02	O With, incl. connector and cable harness 3m	Req. 26K-01, -02, -03 or -04		1 793 627
26G	INSTRUMENT PANEL			
-00	S Without			
-03	O Instrument kit, containing gauges for oil pressure and coolant temp. monitoring		Note! This option is not approved for integration in a classified electrical monitoring system	



Ref	Description	Requirements	Remark	Drw No
26K	COORDINATOR SETTINGS			
-00	S Without			
-01	O Fine tune potentiometer active, without alarm at 0 rpm			
-02	O Fine tune potentiometer active, with alarm at 0 rpm			
-03	O Fine tune potentiometer inactive, with alarm at 0 rpm			
-04	O Fine tune potentiometer inactive, without alarm at 0 rpm			
28B	ENGINE TEMP. REACTION (EMS parameter setting)			
<i>High engine temp reaction, 28B-03 to -06, is recommended in applications where the engine is remotely operated.</i>				
-01	S Only alarm (default value)		Note! • For a classified engine: see applicable classification rules for the intended application. • Alarm is always included regardless of option. • Override possibility refer to engine stop only, not torque reduction.	
-02	O Torque reduction on low limit			
-03	O Engine stop on high limit			
-04	O Engine stop on high limit and torque reduction on low limit			
-05	O Engine stop on high limit (with override possibility)			
-06	O Engine stop on high limit (with override possibility) and torque reduction on low limit			
28C	TEMP. LIMIT HIGH (EMS parameter setting)			
<i>This temp. limit decides the engine temp HIGH alarm limit that are described in 28B-.</i>				
-01	O 98°C			
-02	O 100°C			
-03	O 102°C			
-04	O 103°C			
-05	O 104°C			
-06	S 105°C (default value)			
28D	TEMP. LIMIT LOW (EMS parameter setting)			
<i>This temp. limit decides the engine temp LOW alarm limit that are described in 28B-.</i>				
-01	S 95°C (default value)			
-02	O 98°C			
-03	O 100°C	Not with 28C-01		
-04	O 103°C	Not with 28C-01, -02 or -03		
28E	LOW OIL PRESSURE REACTION (EMS parameter setting)			
<i>Low oil pressure reaction -03 or -04 is recommended in applications where the engine is remotely operated.</i>				
-01	S Only alarm (default value)		Note! For a classified engine: see applicable classification rules for the intended application.	
-02	O Torque reduction, ~30%			
-03	O Engine stop			
-04	O Engine stop with override			



Ref	Description	Requirements	Remark	Drw No
28F	LOW COOLANT LEVEL REACTION (EMS parameter setting)			
Low coolant level reaction -03 or -04 is recommended in applications where the engine is remotely operated. The option is only valid for engines with coolant level sensor, option 25C.				
-00	S Without	Req. 25C-00	Note! For a classified engine: see applicable classification rules for the intended application.	
-01	O Only alarm (default value if 25C-01)	Req. 25C-01		
-02	O Torque reduction, ~30%	Req. 25C-01		
-03	O Engine stop	Req. 25C-01		
-04	O Engine stop with override	Req. 25C-01		
28H	DROOP SETTINGS (EMS parameter setting)			
Droop setting for single speed engines. The value is defined as how much the engine speed increases from full load to zero load, in % in relation to nominal speed.				
-01	O 0%			
-02	O 2.0%			
-03	O 3.5%			
-04	S 4.0% (default value)			
-05	O 6.0%			
-06	O 8.0%			
-07	O 10.0%			
28I	GOVERNOR SETTING (EMS parameter setting)			
-01	S Normal (default value)		Note! The optional settings 28I-02 and -03 should not be chosen without consulting after sales services, these options may only come into question after tests have been made at site.	
-02	O Soft			
-03	O Stiff			
28J	RAMP START DELAY (EMS parameter setting)			
-01	S 0 seconds (default value)		Note! At start this is the time the engine speed shall remain at low idle speed before starting the ramp up to nominal operational speed.	
-02	O 2 seconds			
-03	O 5 seconds			
-04	O 10 seconds			
-05	O 30 seconds			
-06	O 60 seconds			
-07	O 90 seconds			
-08	O 120 seconds			
28K	RAMP UP RATE (EMS parameter setting)			
-01	O 100 rpm/seconds		This is the rate by which the engine speed ramps up, starting from low idle up to nominal operational speed after the delay value defined in Ramp start delay (Price ref. 28J)	
-02	O 200 rpm/seconds			
-03	O 300 rpm/seconds			
-04	O 400 rpm/seconds			
-05	S 500 rpm/seconds (default value)			



Ref	Description	Requirements	Remark	Drw No
28N	LOW IDLE SPEED (EMS parameter setting)			

The low idle speed is set at such a level that resonance frequencies (critical speeds) in the powertrain are avoided.

- 01 O 500 rpm
- 02 O 550 rpm
- 03 O 600 rpm
- 04 S 650 rpm
- 05 O 700 rpm
- 06 O 750 rpm
- 07 O 800 rpm
- 08 O 850 rpm
- 09 O 900 rpm
- 10 O 950 rpm
- 11 S 1000 rpm (default value)
- 12 O 1050 rpm

28O THROTTLE SETTINGS (EMS parameter setting)

Important to consider: Is there a risk for injuries of personnel or damages to equipment if the engine runs out of control?

- 06 S Nominal speed 1500 / 1800 rpm (default value)
- 07 O Fine tune of nominal speed always active

Note! Price ref. 28O-07 is intended for customers who wish to mount a potentiometer directly to the EMS for fine tuning of the nominal engine speed

28S HIGH CHARGE TEMP REACTION

High charge temp reaction 28S-03 to -06 is recommended in applications where the engine is remotely operated.

- 01 S Only alarm
- 02 O Torque reduction on low limit
- 03 O Engine stop on high limit
- 04 O Engine stop on high limit and torque reduction on low limit
- 05 O Engine stop on high limit (with override possibility)
- 06 O Engine stop on high limit (with override possibility) and torque reduction on low limit

Note!

- For a classified engine: see applicable classification rules for the intended application.
- Alarm is always included regardless of option.
- Override possibility refer to engine stop only, not torque reduction.

45 FLYWHEEL

- | | |
|--------------|-----------|
| -01 S SAE 14 | 1 925 825 |
|--------------|-----------|

46 FLYWHEEL HOUSING

- | | |
|-------------------|-----------|
| -01 S SAE1 flange | 1 925 826 |
|-------------------|-----------|



Ref	Description	Requirements	Remark	Drw No
49	ENGINE BRACKET			
<i>Main factors to consider when selecting engine suspension are installation height of the engine and forces applied to the engine and driven equipment due to operating conditions. For further information please see the Installation manual.</i> <i>All engine suspensions are available with:</i> - Front-mounted brackets - Front- and rear-mounted brackets or - Front-mounted brackets and prepared for rear-mounted brackets, which means that the surface on the flywheel housing intended for rear-mounted brackets is unpainted.				
-01 S	Fixed low 120 mm below the crankshaft		Front-mounted brackets	1 866 025
-01ZO	Fixed low 120 mm below the crankshaft		Front-mounted brackets. Prepared for rear-mounted brackets.	1 866 025
-02AO	Fixed low 120 mm below the crankshaft		Front- and rear-mounted bracket	1 866 025
-03 O	Power pack type 230 mm below the crankshaft		Front-mounted brackets	1 858 891
-03ZO	Power pack type 230 mm below the crankshaft		Front-mounted brackets. Prepared for rear-mounted brackets.	1 858 891
-04 O	Power pack type 230 mm below the crankshaft		Front- and rear-mounted brackets	1 858 891
-09 O	Fixed extra low 25 mm above the crankshaft		Front-mounted brackets	1 866 025
-09ZO	Fixed extra low 25 mm above the crankshaft		Front-mounted brackets. Prepared for rear-mounted brackets.	1 866 025
-10 O	Fixed extra low 25 mm above the crankshaft		Front- and rear-mounted bracket	1 866 025
49A	ENGINE SUSPENSION			
-00 S	Without			
-01 O	Stiff rubber suspension	Not with 49-02A, -04 or -10	Front	1 866 025
-02 O	Stiff rubber suspension	Req. 49-02A, -04 or -10	Front and rear	1 866 025
51	AIR CLEANER			
<i>The selection of air cleaner is dependent on the concentration of dust in the air that surrounds the engine. Light duty is suitable for applications working in low dust environment, ocean going. Medium duty is suitable for applications in dusty environments like river boats where dust from land easily can be carried to the vessel.</i>				
-01AS	Prepared			
-05 O	Light duty, Ø15"		Separately. Without hose.	1 925 175
-08 O	Medium duty, Ø15" incl. safety element and pre-cleaner.		Separately. Without hose.	1 925 176
-10 O	Light duty, Ø8"		Mounted on turbo charger	1 529 410
56	EXHAUST BEND			
-01 S	Without, but with turbo-mounted flange	Req. 57-00		2 127 364
-02 O	90° bend, adjustable direction	Req. 57-02, -03, -05, -06		2 127 364
-06 O	Water cooled, 90° bend, pointing rearwards	Req. 57-00	Note! Only for engines with heat exchanger	2 033 702



Ref	Description	Requirements	Remark	Drw No
57	EXHAUST FITTINGS			
-00	S Without			
-02	O Flange, Ø130 mm			2 127 364
-03	O Flange, Ø155 mm			2 127 364
-05	O Compensator and flange, Ø130 mm			2 127 364
-06	O Compensator and flange, Ø155 mm			2 127 364
60	OIL SUMP			
-01	S Deep front oil sump			2 134 590
-02	O Low oil sump			1 927 084
60A	OIL DIPSTICK			
-01	S Short, left hand side, in block			2 127 354
-02	O Long, left hand side, rear in block	Req. 61-05B		2 127 354
60B	ENGINE OIL, FACTORY FILLED			
<i>The engine can be delivered with factory filled engine oil. This option is suitable for customers that are interested in reducing or eliminating the handling of oil in their production process.</i> <i>Engine oil: Scania LDF-3. Viscosity class: 10W-40. Outside temperature: -20°C - >+30°C.</i>				
-00	S Without			
-01	O For deep front oil sump	Req. 60-01		
-03	O For low oil sump	Req. 60-02		
61	OIL FILLER			
-01A	S In engine block, left hand side	Req. 60A-01		2 127 354
-01B	O In valve cover, cyl 1, and engine block, left hand side	Req. 60A-01		2 127 354
-05B	O In valve cover, cyl 1, and engine block, rear left hand side	Req. 60A-02		2 127 354
62	OIL DRAINING			
<i>The selection of oil draining is dependent on the installation. Especially critical is the space available below and next to the oil drain plug. If space for a drain bucket is available, then the standard oil plug is preferred as a simple solution. The hand pump, or electrical pump, is used if the oil is drained to a level above the engine.</i>				
-01	S With plug			2 134 590
-02	O With valve	Req. 60-01		2 012 121
-03	O With hand pump, right hand side		Delivered loose	1 859 126
-04	O With hand pump, left hand side	Req. 60-01	Delivered loose	1 859 126
-05	O With electric pump and 3-way cock on right hand side		Delivered loose	1 407 848
-06	O With electric pump and 3-way cock on left hand side	Req. 60-01	Delivered loose	1 407 848
65	CRANKSHAFT			
<i>The crankshaft is a part subject to special requirements regarding traceability by the class societies. For approval by specific class societies this might be a requirement, to be checked with the class society.</i>				
-01	S Not classified			
-02	O With 3.1 material certificate			
-03	O Classified by Lloyds Register			
				Introduction date to be announced



Ref	Description	Requirements	Remark	Drw No
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72 FAN

The selection of fan is dependent on the need for cooling of the engine. Factors that need to be considered are air pressure drop in the installation and necessary air flow. The fan is normally matched with the radiator chosen for the application.

-00	S Without			
-01	O Prepared for fan, ratio 1:0.9.	Req. 49-03, -03Z or -04	Note! Only for engines with keel cooling 1 861 092 and engines without heat exchanger and water-cooled CAC	
-12	O Pusher, Ø813 mm, ratio 1:0.9	Req. 49-03, -03Z or -04	Note! Only for engines with keel cooling 1 918 482 and engines without heat exchanger and water-cooled CAC	

72A FAN SPACER LENGTH

-01	S 116 mm	Req. 72-01		1 940 791
-02	O 70 mm	Req. 72-01		1 940 791
-03	O 86 mm	Req. 72-01		1 940 791
-04	O 96 mm	Req. 72-01		1 940 791
-05	O 125 mm	Req. 72-01		1 940 791
-06	O 136 mm	Req. 72-01		1 940 791
-08	O 170 mm	Req. 72-01		1 940 791

78 SEA WATER PUMP

The self-priming centrifugal seawater pump is suitable for operations in water containing large amounts of sand, mud or solids. The self-priming pump can withstand to be run without water for a short period. Typical operations are river boats in muddy water and rescue boats that may have to enter the shore during operation.

-00	S Without		Note! Only for engines with keel cooling	
-01	S With		Note! Only for engines with heat exchanger	2 127 357
-02	O With connection hoses		Note! Only for engines with heat exchanger	2 127 357
-03	O With connection tubes		Note! Only for engines with heat exchanger	2 127 357
-11	O Self-priming centrifugal pump	Req. 78B-01	Note! Only for engines with heat exchanger	2 127 357
-12	O Self-priming centrifugal pump with hose connection	Req. 78B-01	Note! Only for engines with heat exchanger	2 127 357
-13	O Self-priming centrifugal pump with tube connection	Req. 78B-01	Note! Only for engines with heat exchanger	2 127 357

78A BILGE PUMP

-00	S Without			
-01	O With one bilge pump	Req. 90-00 and 72-00 Not with 49-03, -03Z or -04		1 866 350
-02	O With two bilge pumps	Req. 90-00 and 72-00 Not with 49-03, -03Z or -04	For example to be used as one bilge pump and one flush pump.	1 866 350



Ref	Description	Requirements	Remark	Drw No
78B	SEA WATER PUMP POSITION			
For SAE B rear high position there is a risk for interference with large transmission housings or generators. In order to avoid interference in these cases SAE B low rear pointing forward is recommended.				
-00	S Without		Note! Only for engines with keel cooling and engines without heat exchanger and water-cooled CAC	
-01AS	SAE B low rear pointing forward		Note! Only for engines with heat exchanger	2 127 357
90	FRONT-MOUNTED POWER TAKE-OFF (PTO)			
A front-mounted PTO is suitable for applications that need high torques, for example large auxiliary pumps and air compressors. Normally the driven equipment is mounted separate from the engine.				
-00	S Without			
-01	O Stub shaft for connection of flexible coupling. Max torque 800 Nm	Req. 72-00		1 883 974
-02	O Crankshaft pulley with two extra grooves, Ø260 mm	Req. 72-00		1 883 974
-03	O Stub shaft for connection of flexible coupling with crankshaft pulley with two extra grooves, Ø260 mm	Req. 72-00		1 883 974
-04	O Crankshaft pulley with three extra grooves, Ø260 mm	Req. 72-00		1 883 974
-07	O Stub shaft for connection of flexible coupling with crankshaft pulley with three extra grooves, Ø260 mm	Req. 72-00		1 883 974
91	SIDE-MOUNTED POWER TAKE-OFF (PTO)			
A side-mounted PTO is used for low rated engine-mounted hydraulic pumps or compressors.				
-00	S Without			
-01	O Prepared for SAE B			
-02	O SAE B, 2-hole, 13 teeth. Gear ratio 1:1.19. Pointing backwards.		Note! Max torque 250 Nm (continuous) Max torque 400 Nm (intermittent)	1 448 964
-03	O SAE A, 2-hole, 9 teeth. Gear ratio 1:1.71. Pointing backwards.	Req. 93-00	Note! Max torque 100 Nm (continuous) Max torque 125 Nm (intermittent)	1 798 247
-04	O SAE A and SAE B	Req. 93-00		
-05	O SAE B, 2-hole, 13 teeth. Gear ratio 1:1.19. Low, pointing forward.	Req. 78B-00		1 945 647
-08	O SAE A and SAE B low, pointing forward	Req. 78B-00 Req. 93-00		
93	HYDRAULIC PUMP			
-00	S Without			
-01	O Capacity 16 l/min at 170 bar intermittent, 25-30 bar continuous		Note! Without pressure reduction valve	1 757 131 1 449 167
-02	O Capacity 25 l/min at 170 bar intermittent, 25-30 bar continuous		Note! Without pressure reduction valve	1 757 131 1 449 167



Ref	Description	Requirements	Remark	Drw No
96C	STUDS IN FLYWHEEL HOUSING			
-00	S Without			
-01	O With			
98C	FUEL PRE-FILTER			
<i>Fuel pre-filter is required for all Scania marine engines. Water will condensate in the tank and enter the fuel, thus a risk of engine disturbances. The fuel pre-filter separates water from the fuel. The option without is valid for customers who uses a non-Scania pre-filter.</i>				
-00	O Without		Note! 98C-00 requires a water separating pre-filter from an external manufacturer. If no filter is mounted the engine warranty is not valid.	
-01	S Single fuel filter with water separator	Req. 10M-00	Note! Not type approved by any classification society.	1 774 501
-03	O Reversible dual fuel filter with water separator		Note! Type approved by ABS and BV.	1 769 500
98D	CAB HEATER			
-00	S Without			
-01	O Prepared for cab heater connection front			
-02	O Prepared for cab heater connection rear			
99G	PAINTWORK			
-01	S Orange heavy duty quality / silver on warm parts			
99L	CRANKCASE VENTILATION			
-01	S Closed ventilation			1 866 026
99P	OPERATOR'S MANUAL			
-00	O Without		Note! If a preferred language is not specified when ordering, the operator's manual will be delivered in English. Available languages are: Chinese (simplified), Chinese (trad.), Czech, Danish, Dutch, English, Finnish, French, German, Italian, Japanese, Korean, Norwegian, Polish, Portuguese, Russian, Spanish and Swedish	
-01	S 1 copy			
-02	O 2 copies			
-03	O 3 copies			
99Q	SPARE PARTS CATALOGUE			
-00	S Without			
-01	O 1 copy			
-02	O 2 copies			
-03	O 3 copies			
99T	FUEL MAIN FILTER			
<i>Reversible fuel filters enable the switching of fuel filters during operation. This is required by classification societies in many applications.</i>				
-00	S Single fuel filter			
-01	O Reversible dual fuel filter		Note! Approved for classification.	
99U	FUEL HOSES			
-00	O Without			
-01	S With nipples			
-02	O With two fuel hoses			



5 ENGINE DATA 13-series

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General information

Standard equipment

Scania Engine Management System, EMS

Unit injectors, PDE

Turbocharger

Water-cooled charge air cooler

Fuel pre-filter with water separator

Fuel filter

Oil filter, full flow

Centrifugal oil cleaner

Oil cooler, integrated in block

Oil filler, in engine block

Oil draining with plug

Oil dipstick, in block

Starter, 2-pole, 7.0 kW, (EMS controlled)

Alternator 2-pole, 100A

Flywheel SAE 14

Silumin flywheel housing, SAE1 flange

Front-mounted engine brackets

Protection covers

Sea water pump (engines with heat exchanger only)

Heat exchanger with expansion tank (engines with heat exchanger only)

Closed crankcase ventilation

Operator's manual

For optional equipment, see 'Equipment list'.

Note! No optional equipment is type approved for classification if not otherwise stated.

Ratings

ICFN, Continuous service

Rated power available 1 h/1 h.

Unlimited h/year service time at a total load factor of 100%.

IFN, Intermittent service

Intended for intermittent use where rated power is available 1 hour/3 hours period.

Accumulated load factor must not exceed 80% of rated power.

Unlimited h/year service time.

Patrol craft long

Intended for intermittent use where rated power is available 1 hour/6 hours period.

Between full load operations engine rpm must be reduced at least 10% from max. obtained rpm. Accumulated total service time max. 2000 h/year.

Patrol craft short

Intended for intermittent use where rated power is available 1 hour/12 hours

period. Between full load operations engine rpm must be reduced at least 10% from max. obtained rpm. Accumulated total service time max. 1200 h/year.

Emission compliance and classification

For detailed information about approved and certified engines and classification society approvals, access SAIL at <http://sail.scania.com> to view or download the appropriate certificate.



Engine programme

EU Stage IIIA, US Tier 2 and IMO Tier II compliant engines

With heat exchanger

Engine type	ICFN 1800 rpm		IFN 2100 rpm		Patrol Craft Long 2300 rpm		Patrol Craft Short 2300 rpm		Factory order reference sequence			
	kW	hp	kW	hp	kW	hp	kW	hp	Rating	Engine speed	Output	Engine ref.
DI13 070M	294	400	-	-	-	-	-	-	13-01	35-02	12-06	03-01
DI13 070M	331	450	-	-	-	-	-	-	13-01	35-02	12-07	03-02
DI13 070M	368	500	-	-	-	-	-	-	13-01	35-02	12-08	03-03
DI13 070M	405	550	-	-	-	-	-	-	13-01	35-02	12-09	03-04
DI13 078M	-	-	331	450	-	-	-	-	13-02	35-04	12-07	03-51
DI13 078M	-	-	368	500	-	-	-	-	13-02	35-04	12-08	03-52
DI13 078M	-	-	405	550	-	-	-	-	13-02	35-04	12-09	03-53
DI13 072M	-	-	441 ¹⁾	600 ¹⁾	-	-	-	-	13-02	35-06	12-14	03-21
DI13 072M	-	-	-	-	478	650	-	-	13-02	35-06	12-10	03-22
DI13 077M	-	-	-	-	515	700	-	-	13-02	35-06	12-11	03-41
DI13 077M	-	-	-	-	-	-	551	750	13-02	35-06	12-15	03-42

1) 2300 rpm

With keel cooling

Engine type	ICFN 1800 rpm		IFN 2100 rpm		Patrol Craft Long 2300 rpm		Patrol Craft Short 2300 rpm		Factory order reference sequence			
	kW	hp	kW	hp	kW	hp	kW	hp	Rating	Engine speed	Output	Engine ref.
DI13 071M	294	400	-	-	-	-	-	-	13-01	35-02	12-06	03-11
DI13 071M	331	450	-	-	-	-	-	-	13-01	35-02	12-07	03-12
DI13 071M	368	500	-	-	-	-	-	-	13-01	35-02	12-08	03-13
DI13 073M	-	-	331	450	-	-	-	-	13-02	35-04	12-07	03-31
DI13 073M	-	-	368	500	-	-	-	-	13-02	35-04	12-08	03-32
DI13 073M	-	-	405	550	-	-	-	-	13-02	35-04	12-09	03-33

5_A



Basic data

General

Configuration and number of cylinders	6 in-line	
Working principle	4-stroke	
Bore x stroke	130 x 160	mm
Displacement	12.7	dm ³
Compression ratio	16.3:1	
Firing order	1 - 5 - 3 - 6 - 2 - 4	
Piston speed		
at 1500 rpm	8.0	m/s
at 1800 rpm	9.6	m/s
Pistons	Steel pistons	
Camshaft	High position alloy steel	
Connection rods	I-section press forgings of alloy steel	
Crankshaft	Alloy steel with hardened and polished bearing surfaces	
Rotation, seen from flywheel end	Counter clockwise	
Total moment of inertia with flywheel		
SAE 14	3.11	kgm ²
Number of teeth on flywheel ring gear	158	
Weight approx. (excl. oil and coolant)		
with heat exchanger	1190	kg
with keel cooling	1140	kg

Lubrication system

Oil capacity (deep front oil sump with ladder frame)		
min	39	dm ³
max	45	dm ³
Oil consumption	<0.2	g/kWh
Oil change intervals	500	h
Oil grade		
engines run on low-sulphur fuel	ACEA E5 or E7	
engines not run on low-sulphur fuel	Total Base Number (TBN) at least 12 (ASTM 2896)	
Oil pressure		
normal	3-6	bar
minimum permitted at idle speed	0.7	bar
Oil temperature		
normal	90-110	°C
Oil cleaner	Centrifugal	
filtration	5-7	Micron
Oil filter	Paper/Full flow	
Oil cooler	Water cooled/Full flow	

Injection system

Type	Unit injectors
Governor	Scania Engine Management System, EMS
Fuel filter	Paper filter element

**Cooling system**

Coolant volume

with heat exchanger	40	dm ³
with keel cooling, single circuit	26	dm ³

Coolant temperature

with heat exchanger	90-95	°C
with keel cooling	83-88	°C

Number of thermostats..... 1

Opening temperature

with heat exchanger	80/87	°C
with keel cooling	75	°C

Intake system

Permissible pressure drop in intake system

with cleaned or new filter.....30 mbar

Permissible pressure drop in intake system

with blocked (dirty) filter65 mbar

Electrical system

Type2-pole, 24V, DC

Starter, standard equipment.....2-pole, 24V, 7.0 kW

Alternator, standard equipment 2-pole, 28V, 100A



Technical data

DI13 070M, 294 kW / 400 hp - With heat exchanger (engine ref. 03-01)

Emission compliance	Fuel injection system	Rating
EU Stage IIIA, US Tier 2, IMO Tier II	PDE	ICFN, Continuous service

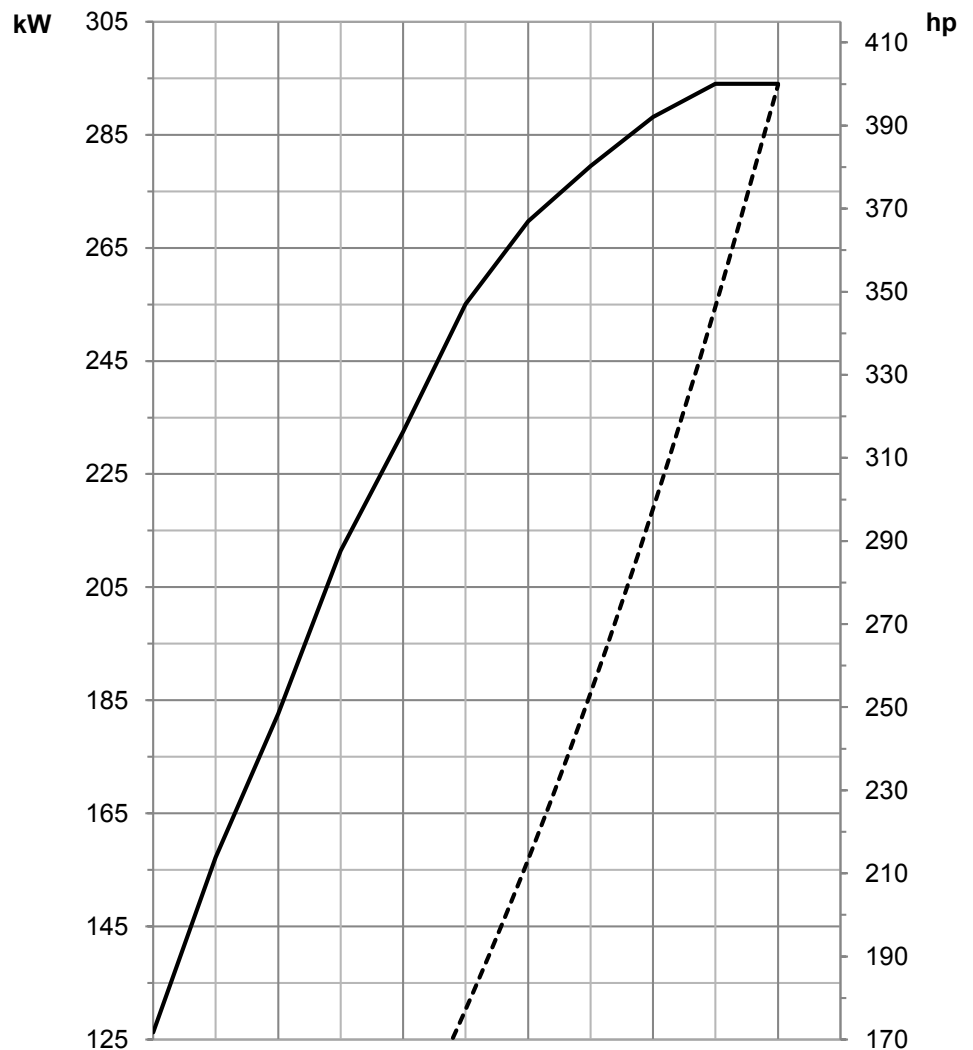
	Engine speed (rpm)				Unit
	1200	1500	1700	1800	
Gross power					
Full load curve	232	279	294	294	kW
	316	380	400	400	hp
Propeller curve (assumed exponent 2.5)	107	186	255	294	kW
	145	253	347	400	hp
Gross torque	1850	1779	1651	1560	Nm
Spec. fuel consumption					
full load	193	194	203	205	g/kWh
3/4 load	195	201	204	214	g/kWh
1/2 load	200	204	211	220	g/kWh
Propeller curve (assumed exponent 2.5)	26	45	62	72	l/h
Heat rejection					
to coolant	156	186	216	221	kW
to exhaust gas	139	172	193	195	kW
to surrounding air	11	13	14	14	kW
Air consumption	16	23	28	29	kg/min
Pressure in intake manifold	1.1	1.3	1.5	1.5	Bar
Exhaust flow	17	24	29	30	kg/min
Exhaust temperature	471	422	395	386	°C



DI13 070M, 294kW / 400 hp- With heat exchanger (engine ref. 03-01)

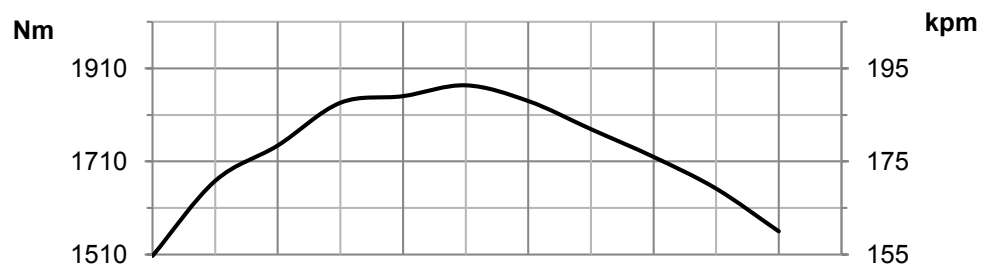
Power

(kW x 1.36 = hp)



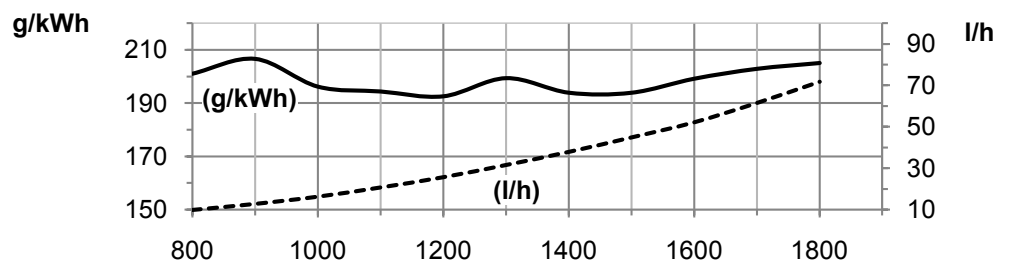
Torque

(Nm / 9.81 = kpm)



Spec. fuel consumption

(g/kWh / 1.36 = g/hph)



----- Propeller curve, assumed exponent 2.5
—— Full load curve

5_A



Technical data

DI13 070M, 331 kW / 450 hp - With heat exchanger (engine ref. 03-02)

Emission compliance	Fuel injection system	Rating
EU Stage IIIA, US Tier 2, IMO Tier II	PDE	ICFN, Continuous service

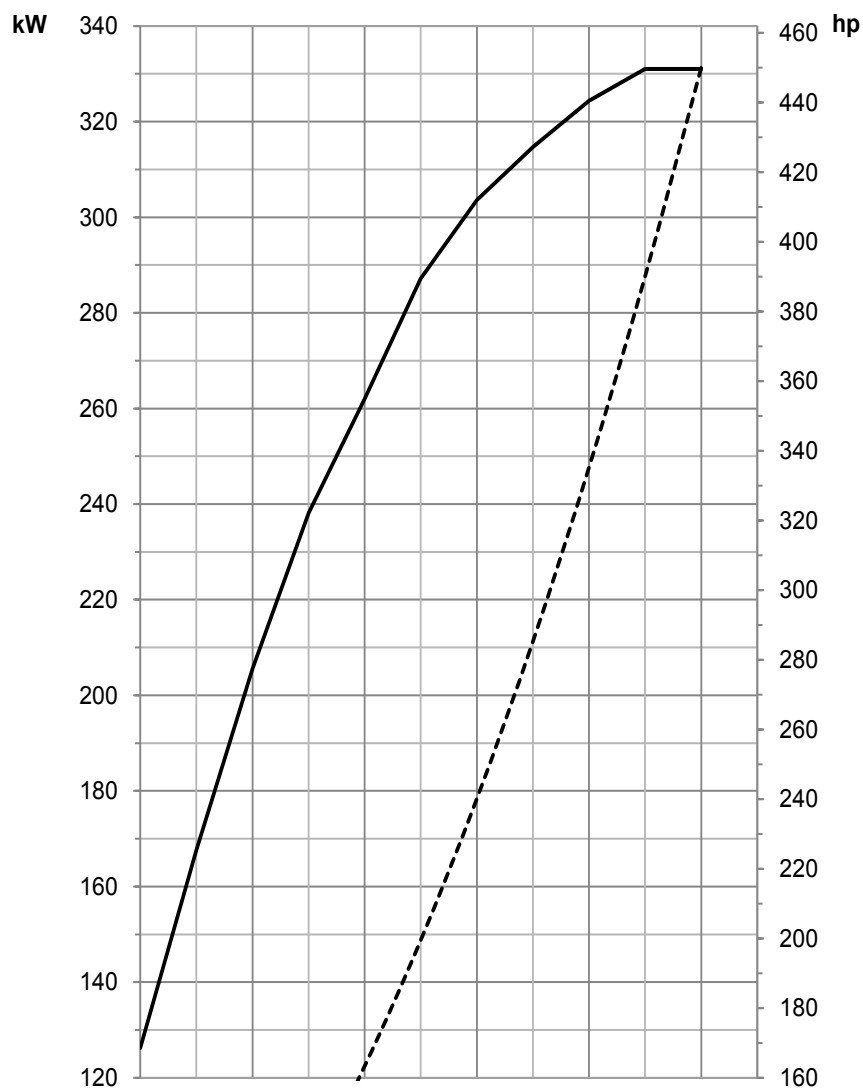
	Engine speed (rpm)				Unit
	1200	1500	1700	1800	
Gross power					
Full load curve	262	315	331	331	kW
	356	428	450	450	hp
Propeller curve (assumed exponent 2.5)	120	210	287	331	kW
	163	285	390	450	hp
Gross torque	2085	2003	1859	1756	Nm
Spec. fuel consumption					
full load	192	191	201	202	g/kWh
3/4 load	194	200	203	212	g/kWh
1/2 load	199	203	208	217	g/kWh
Propeller curve (assumed exponent 2.5)	29	50	69	79	l/h
Heat rejection					
to coolant	174	205	241	242	kW
to exhaust gas	156	189	213	214	kW
to surrounding air	12	14	16	16	kW
Air consumption	18	25	30	31	kg/min
Pressure in intake manifold	1.3	1.5	1.7	1.6	Bar
Exhaust flow	19	26	31	32	kg/min
Exhaust temperature	482	430	407	400	°C



DI13 070M, 331 kW / 450 hp - With heat exchanger (engine ref. 03-02)

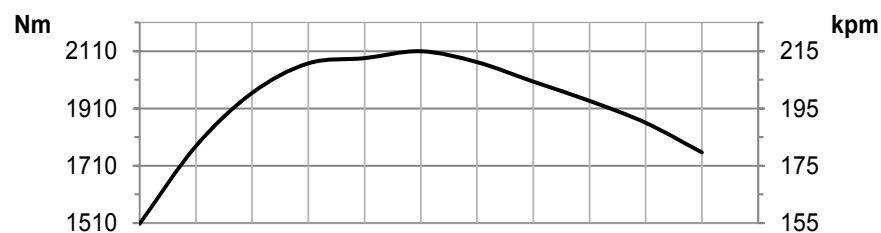
Power

(kW x 1.36 = hp)



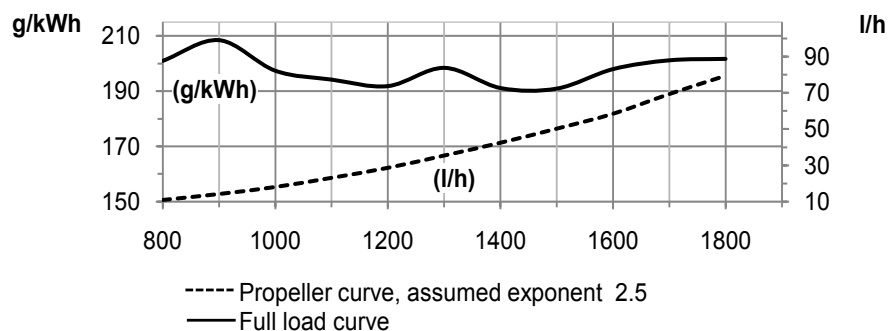
Torque

(Nm / 9.81 = kpm)



Spec. fuel consumption

(g/kWh / 1.36 = g/hph)



5_A



Technical data

DI13 070M, 368 kW / 500 hp - With heat exchanger (engine ref. 03-03)

Emission compliance	Fuel injection system	Rating
EU Stage IIIA, US Tier 2, IMO Tier II	PDE	ICFN, Continuous service

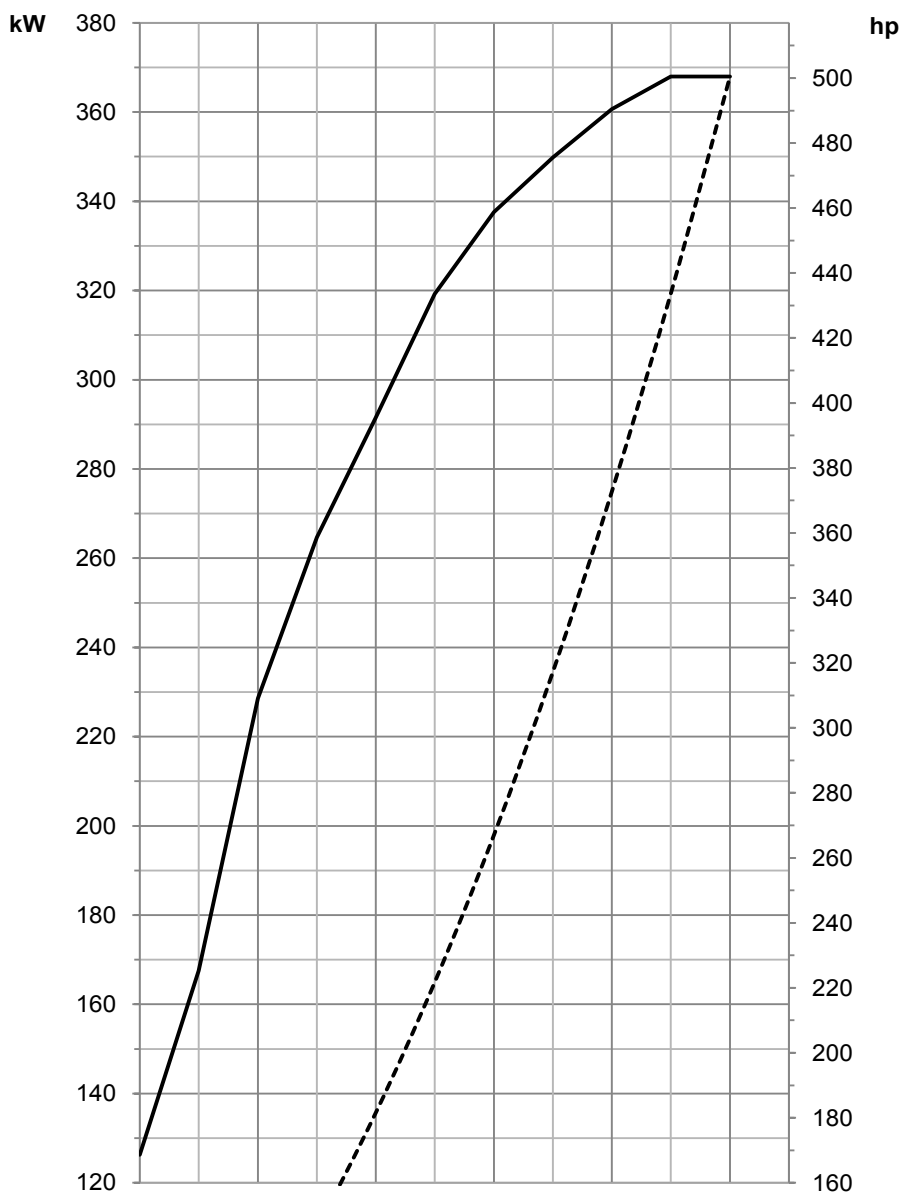
	Engine speed (rpm)				Unit
	1200	1500	1700	1800	
Gross power					
Full load curve	292	350	368	368	kW
	396	476	500	500	hp
Propeller curve (assumed exponent 2.5)	134	233	319	368	kW
	182	317	434	500	hp
Gross torque	2320	2227	2067	1952	Nm
Spec. fuel consumption					
full load	192	191	196	200	g/kWh
3/4 load	193	196	203	207	g/kWh
1/2 load	197	202	206	216	g/kWh
Propeller curve (assumed exponent 2.5)	32	56	77	88	l/h
Heat rejection					
to coolant	194	228	255	267	kW
to exhaust gas	174	209	225	235	kW
to surrounding air	13	16	17	18	kW
Air consumption	19	27	31	32	kg/min
Pressure in intake manifold	1.5	1.8	1.8	1.8	Bar
Exhaust flow	20	28	32	33	kg/min
Exhaust temperature	489	436	416	417	°C



DI13 070M, 368kW / 500 hp - With heat exchanger (engine ref. 03-03)

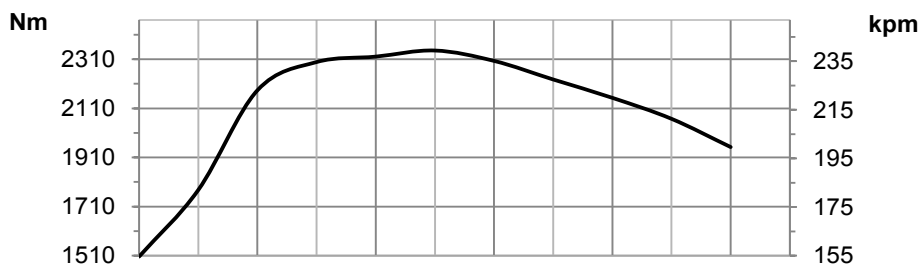
Power

(kW x 1.36 = hp)



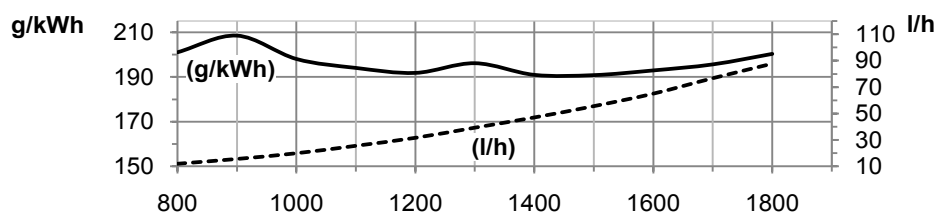
Torque

(Nm / 9.81 = kpm)



Spec. fuel consumption

(g/kWh / 1.36 = g/hph)



----- Propeller curve, assumed exponent 2.5
— Full load curve



Technical data

DI13 070M, 405 kW / 550 hp - With heat exchanger (engine ref. 03-04)

Emission compliance	Fuel injection system	Rating
EU Stage IIIA, US Tier 2, IMO Tier II	PDE	ICFN, Continuous service

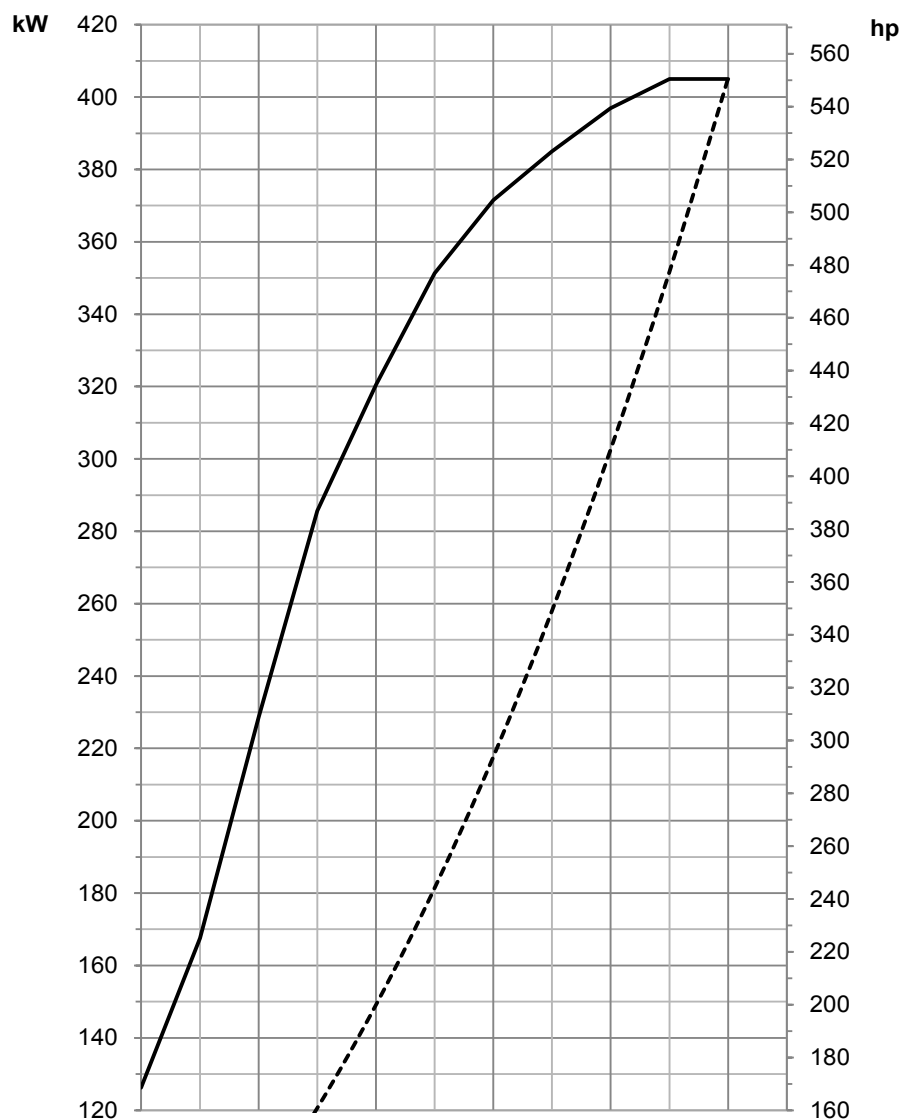
	Engine speed (rpm)				Unit
	1200	1500	1700	1800	
Gross power					
Full load curve	320	385	405	405	kW
	436	524	550	550	hp
Propeller curve (assumed exponent 2.5)	147	257	351	405	kW
	200	349	477	550	hp
Gross torque	2550	2451	2275	2149	Nm
Spec. fuel consumption					
full load	192	191	196	201	g/kWh
3/4 load	192	193	203	204	g/kWh
1/2 load	196	202	204	214	g/kWh
Propeller curve (assumed exponent 2.5)	35	60	83	97	l/h
Heat rejection					
to coolant	214	254	284	296	kW
to exhaust gas	190	229	248	259	kW
to surrounding air	15	18	19	19	kW
Air consumption	21	29	32	33	kg/min
Pressure in intake manifold	1.7	2.0	1.9	1.9	Bar
Exhaust flow	22	30	33	34	kg/min
Exhaust temperature	493	444	435	440	°C



DI13 070M, 405 kW / 550 hp - With heat exchanger (engine ref. 03-04)

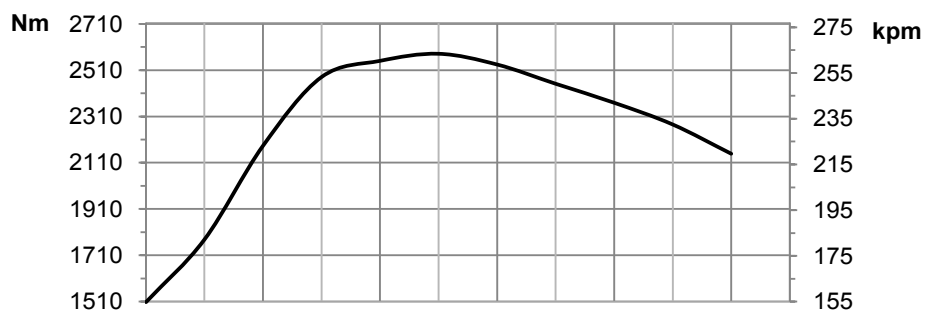
Power

(kW x 1.36 = hp)



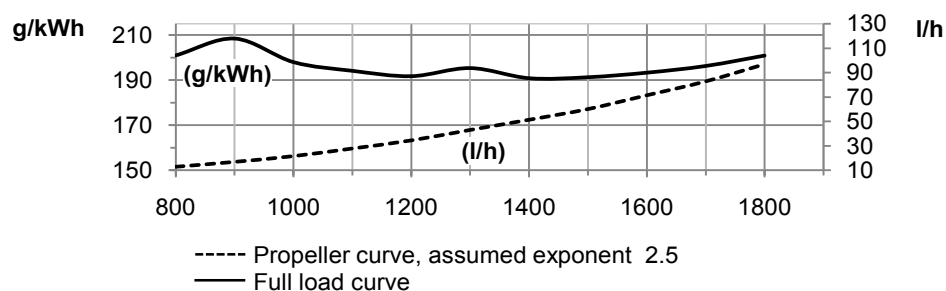
Torque

(Nm / 9.81 = kpm)



Spec. fuel consumption

(g/kWh / 1.36 = g/hph)





Technical data

DI13 078M, 331 kW / 450 hp - With heat exchanger (engine ref. 03-51)

Emission compliance	Fuel injection system	Rating
EU Stage IIIA, US Tier 2, IMO Tier II	PDE	IFN, Intermittent service

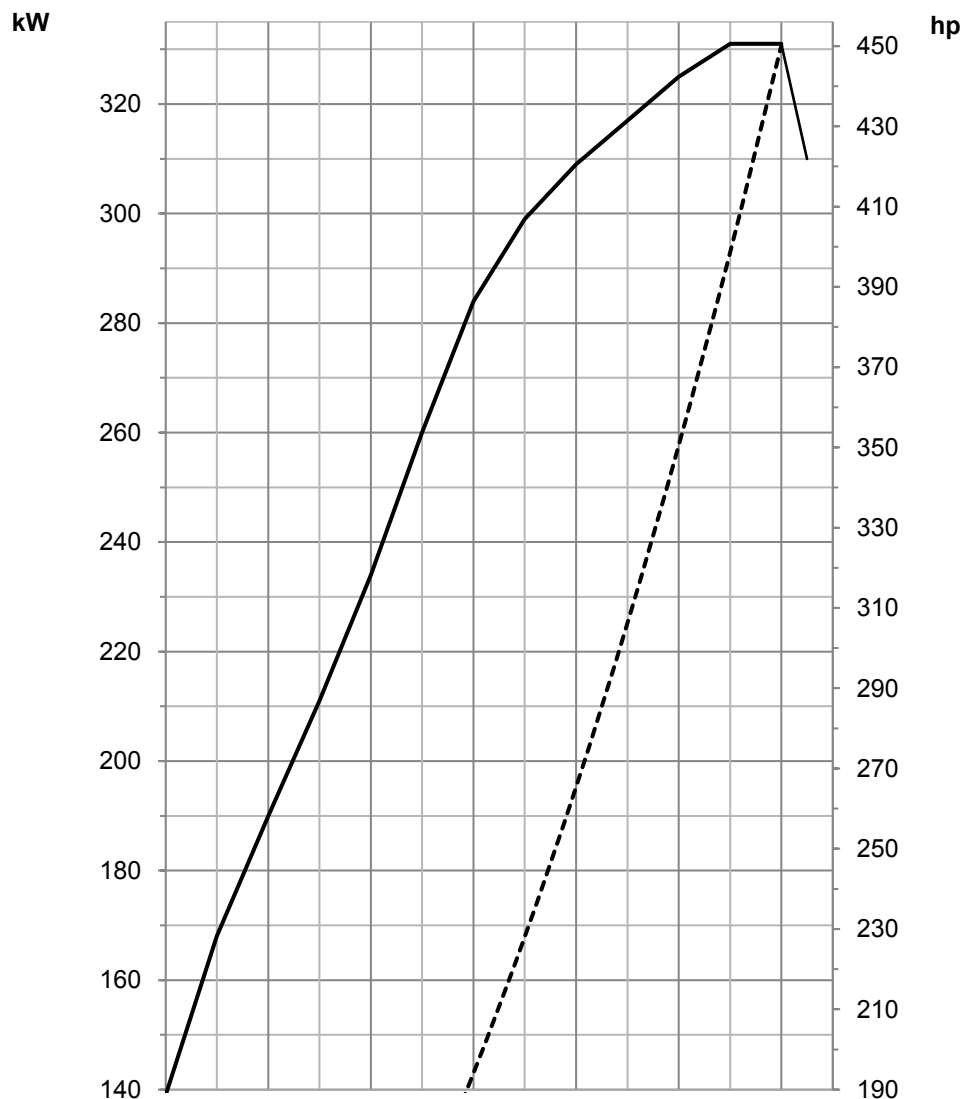
	Engine speed (rpm)					Unit
	1200	1500	1800	2000	2100	
Gross power						
Full load curve	211	284	317	331	331	kW
	287	386	431	450	450	hp
Propeller curve (assumed exponent 2.5)	82	143	225	293	331	kW
	111	194	306	398	450	hp
Gross torque	1679	1808	1682	1580	1505	Nm
Spec. fuel consumption						
full load	190	203	193	202	211	g/kWh
3/4 load	192	201	196	205	214	g/kWh
1/2 load	197	206	205	215	227	g/kWh
Propeller curve (assumed exponent 2.5)	20	35	53	71	84	l/h
Heat rejection						
to coolant	139	204	210	237	255	kW
to exhaust gas	123	192	195	220	239	kW
to surrounding air	10	14	15	16	17	kW
Air consumption	15	25	29	32	34	kg/min
Pressure in intake manifold	0.9	1.5	1.4	1.5	1.5	Bar
Exhaust flow	15	26	30	33	35	kg/min
Exhaust temperature	467	440	395	395	407	°C



DI13 078M, 331 kW / 450 hp - With heat exchanger (engine ref. 03-51)

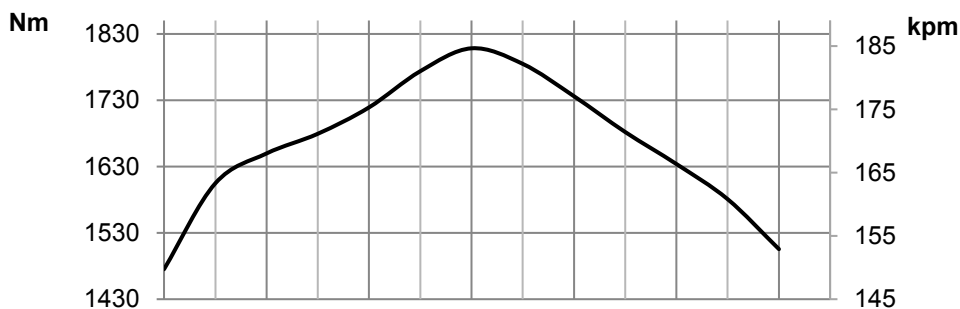
Power

(kW x 1.36 = hp)



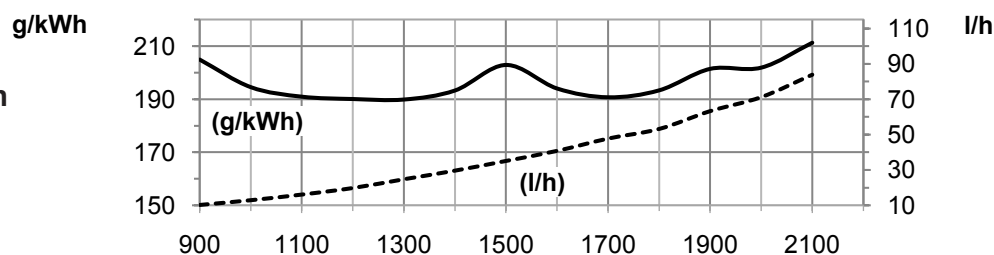
Torque

(Nm / 9.81 = kpm)



Spec. fuel consumption

(g/kWh / 1.36 = g/hph)



--- Propeller curve, assumed exponent 2.5
— Full load curve



Technical data

DI13 078M, 368 kW / 500 hp - With heat exchanger (engine ref. 03-52)

Emission compliance	Fuel injection system	Rating
EU Stage IIIA, US Tier 2, IMO Tier II	PDE	IFN, Intermittent service

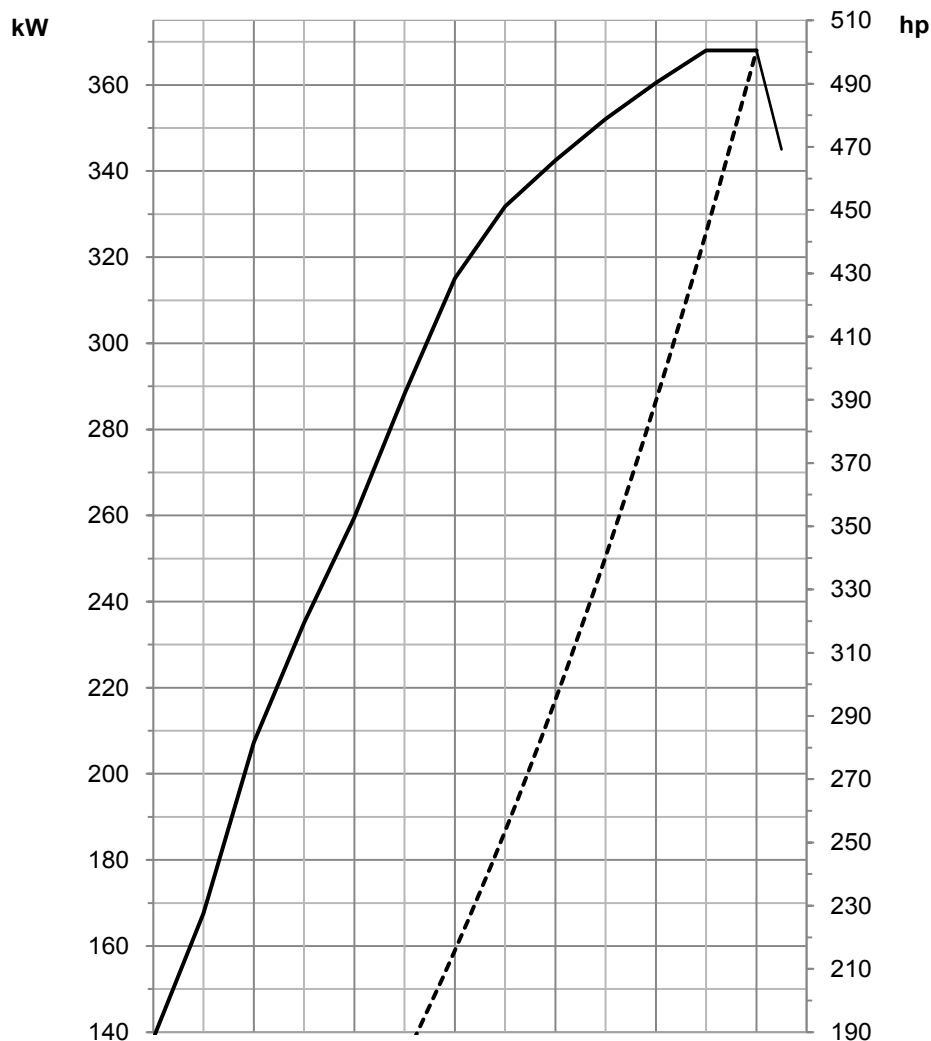
	Engine speed (rpm)					Unit
	1200	1500	1800	2000	2100	
Gross power						
Full load curve	235	315	352	368	368	kW
	320	428	479	500	500	hp
Propeller curve (assumed exponent 2.5)	91	159	250	326	368	kW
	124	216	340	443	500	hp
Gross torque	1870	2005	1867	1757	1673	Nm
Spec. fuel consumption						
full load	190	201	193	201	208	g/kWh
3/4 load	191	201	195	203	213	g/kWh
1/2 load	195	204	202	212	223	g/kWh
Propeller curve (assumed exponent 2.5)	22	39	59	79	92	l/h
Heat rejection						
to coolant	153	223	233	261	274	kW
to exhaust gas	137	209	217	245	259	kW
to surrounding air	11	15	16	18	18	kW
Air consumption	16	26	31	34	35	kg/min
Pressure in intake manifold	1.0	1.7	1.6	1.6	1.6	Bar
Exhaust flow	16	27	32	35	36	kg/min
Exhaust temperature	479	447	407	416	426	°C



DI13 078M, 368 kW / 500 hp - With heat exchanger (engine ref. 03-52)

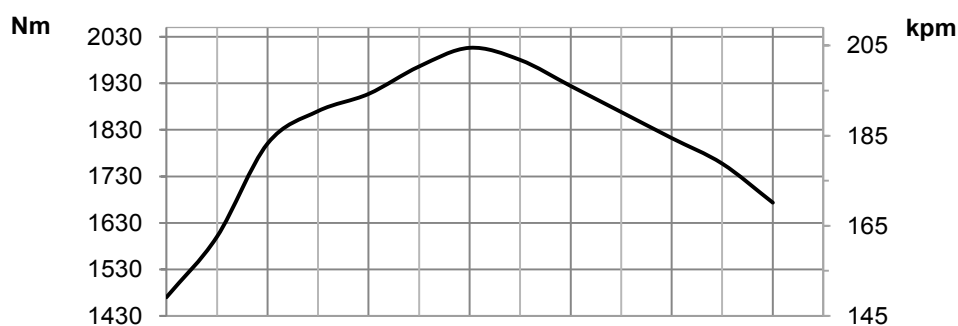
Power

(kW x 1.36 = hp)



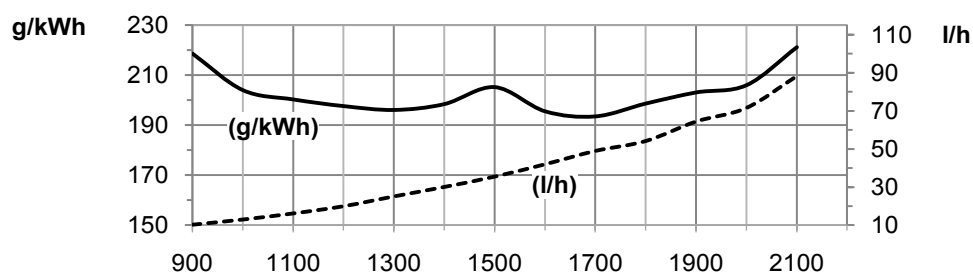
Torque

(Nm / 9.81 = kpm)



Spec. fuel consumption

(g/kWh / 1.36 = g/hph)



--- Propeller curve, assumed exponent 2.5
— Full load curve



Technical data

DI13 078M, 405 kW / 550 hp - With heat exchanger (engine ref. 03-53)

Emission compliance	Fuel injection system	Rating
EU Stage IIIA, US Tier 2, IMO Tier II	PDE	IFN, Intermittent service

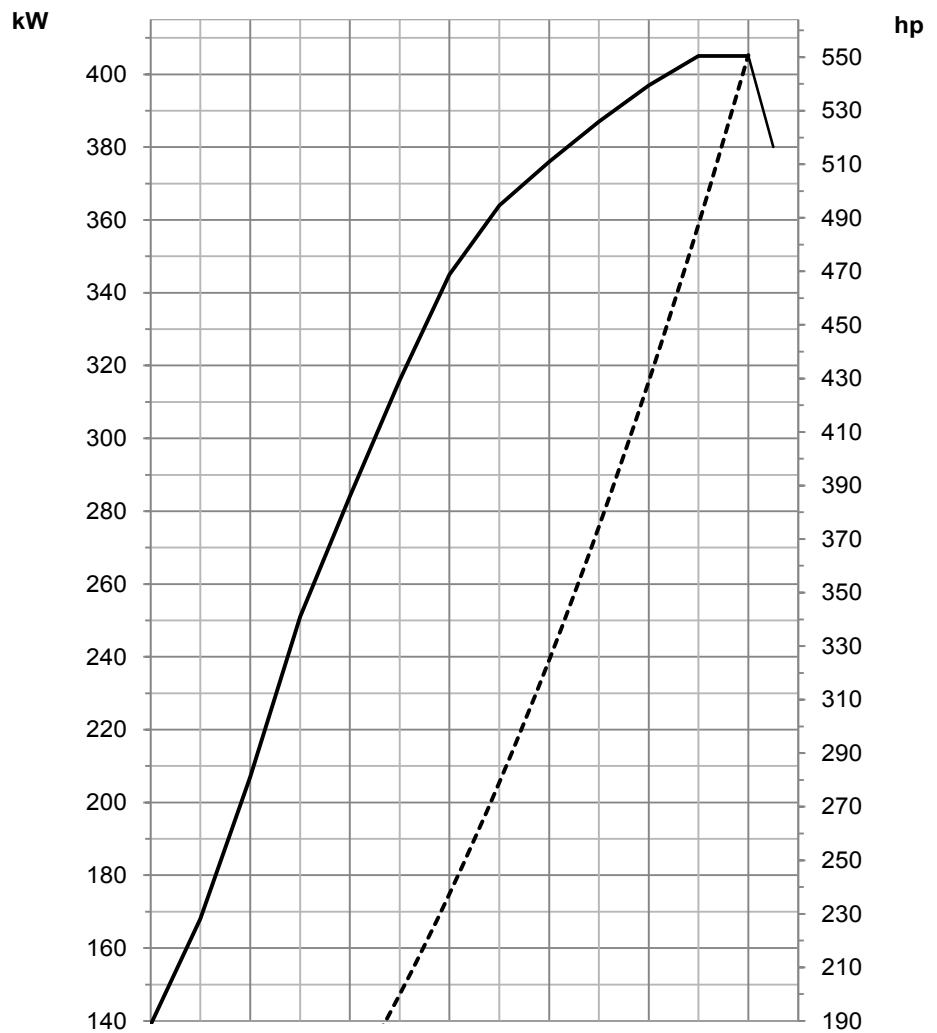
	Engine speed (rpm)					Unit
	1200	1500	1800	2000	2100	
Gross power						
Full load curve	251	345	387	405	405	kW
	341	469	526	550	550	hp
Propeller curve (assumed exponent 2.5)	100	175	275	358	405	kW
	136	238	375	488	550	hp
Gross torque	1997	2196	2053	1934	1842	Nm
Spec. fuel consumption						
full load	189	201	193	202	207	g/kWh
3/4 load	191	202	194	202	212	g/kWh
1/2 load	194	203	200	209	219	g/kWh
Propeller curve (assumed exponent 2.5)	24	42	64	87	101	l/h
Heat rejection						
to coolant	164	244	254	287	300	kW
to exhaust gas	145	228	238	272	284	kW
to surrounding air	11	17	18	20	20	kW
Air consumption	16	28	32	35	36	kg/min
Pressure in intake manifold	1.1	1.9	1.8	1.7	1.7	Bar
Exhaust flow	17	29	33	36	37	kg/min
Exhaust temperature	485	455	421	442	451	°C



DI13 078M, 405 kW / 550 hp - With heat exchanger (engine ref. 03-53)

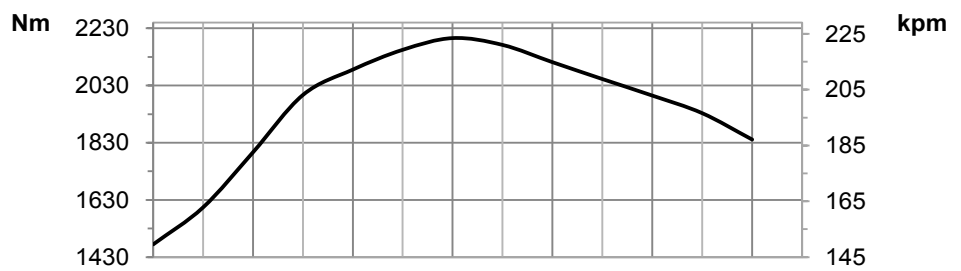
Power

(kW x 1.36 = hp)



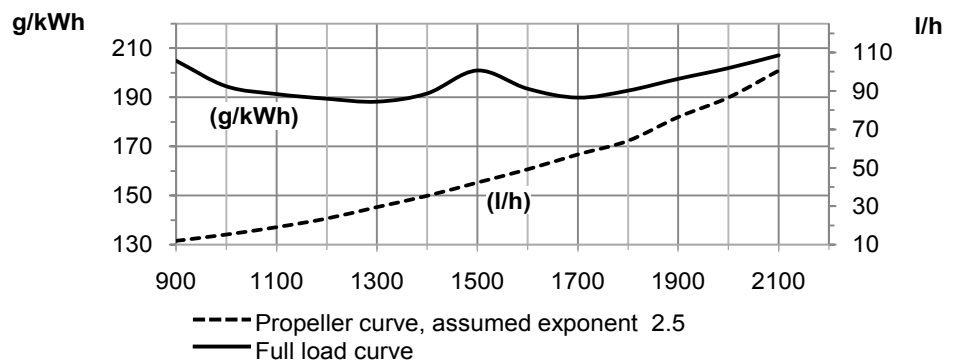
Torque

(Nm / 9.81 = kpm)



Spec. fuel consumption

(g/kWh / 1.36 = g/hph)





Technical data

DI13 072M, 441 kW / 600 hp - With heat exchanger (engine ref. 03-21)

Emission compliance	Fuel injection system	Rating
EU Stage IIIA, US Tier 2, IMO Tier II	PDE	IFN, Intermittent service

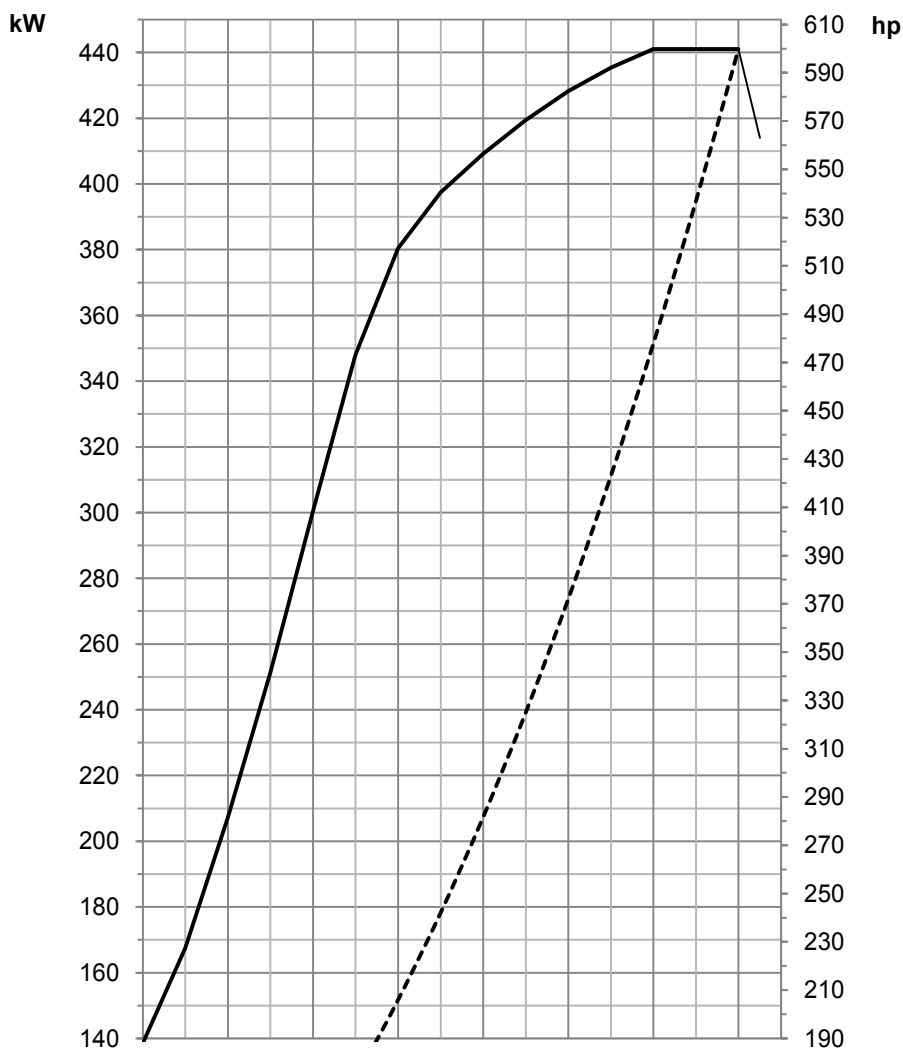
	Engine speed (rpm)						Unit
	1200	1500	1800	2100	2200	2300	
Gross power							
Full load curve	251	380	419	441	441	441	kW
	342	517	570	600	600	600	hp
Propeller curve (assumed exponent 2.5)	87	151	239	351	395	441	kW
	118	206	325	478	537	600	hp
Gross torque	2000	2422	2225	2005	1914	1831	Nm
Spec. fuel consumption							
full load	209	202	195	201	204	209	g/kWh
3/4 load	200	208	201	210	206	220	g/kWh
1/2 load	198	207	210	211	218	236	g/kWh
Propeller curve (assumed exponent 2.5)	21	38	59	88	96	110	l/h
Heat rejection							
to coolant	184	250	259	297	307	323	kW
to exhaust gas	183	276	285	305	310	322	kW
to surrounding air	13	18	19	21	21	22	kW
Air consumption	16	27	35	41	43	45	kg/min
Pressure in intake manifold	0.9	1.6	1.8	2.0	2.0	2.0	Bar
Exhaust flow	16	28	36	43	43	46	kg/min
Exhaust temperature	613	549	461	424	424	415	°C



DI13 072M, 441 kW / 600 hp - With heat exchanger (engine ref. 03-21)

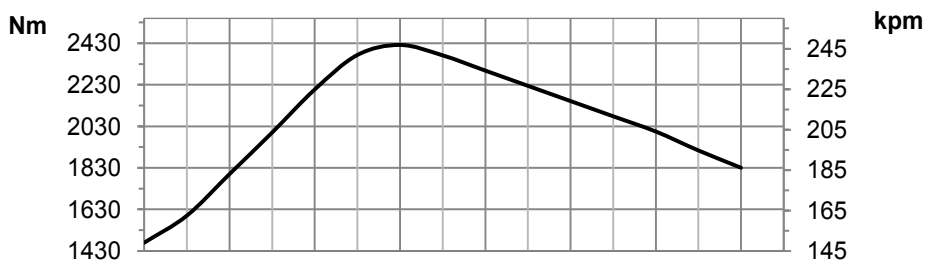
Power

(kW x 1.36 = hp)



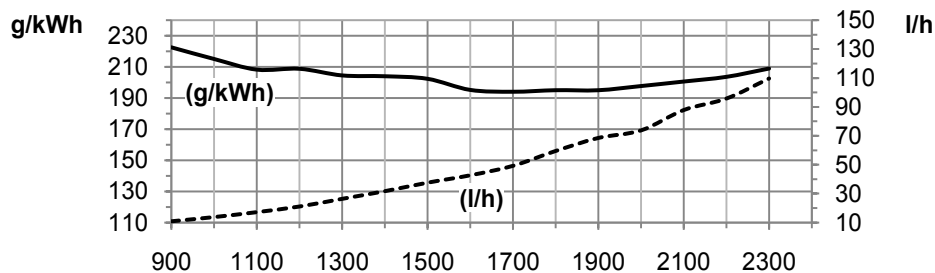
Torque

(Nm / 9.81 = kpm)



Spec. fuel consumption

(g/kWh / 1.36 = g/hph)



--- Propeller curve, assumed exponent 2.5
— Full load curve



Technical data

DI13 072M, 478 kW / 650 hp - With heat exchanger (engine ref. 03-22)

Emission compliance	Fuel injection system	Rating
EU Stage IIIA, US Tier 2, IMO Tier II	PDE	Patrol craft long

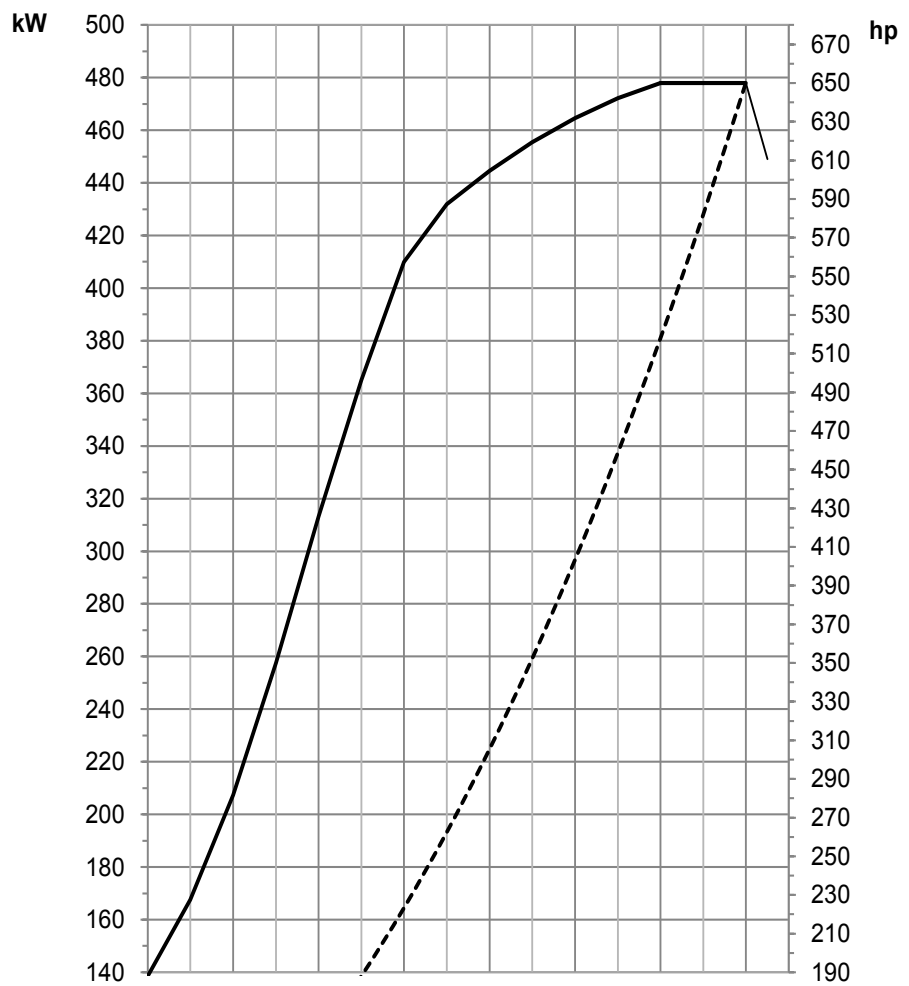
	Engine speed (rpm)						Unit
	1200	1500	1800	2100	2200	2300	
Gross power							
Full load curve	258	410	455	478	478	478	kW
	350	558	619	650	650	650	hp
Propeller curve (assumed exponent 2.5)	94	164	259	381	428	478	kW
	128	223	352	518	582	650	hp
Gross torque	2050	2610	2416	2174	2075	1985	Nm
Spec. fuel consumption							
full load	211	204	194	201	205	210	g/kWh
3/4 load	200	208	198	210	205	219	g/kWh
1/2 load	198	207	209	211	214	233	g/kWh
Propeller curve (assumed exponent 2.5)	23	41	64	95	104	119	l/h
Heat rejection							
to coolant	192	274	281	323	336	350	kW
to exhaust gas	192	301	305	331	341	352	kW
to surrounding air	13	20	21	23	23	24	kW
Air consumption	16	29	36	43	45	47	kg/min
Pressure in intake manifold	1.0	1.8	2.0	2.1	2.1	2.1	Bar
Exhaust flow	17	30	38	45	46	48	kg/min
Exhaust temperature	620	556	468	437	434	432	°C



DI13 072M, 478 kW / 650 hp - With heat exchanger (engine ref. 03-22)

Power

(kW x 1.36 = hp)



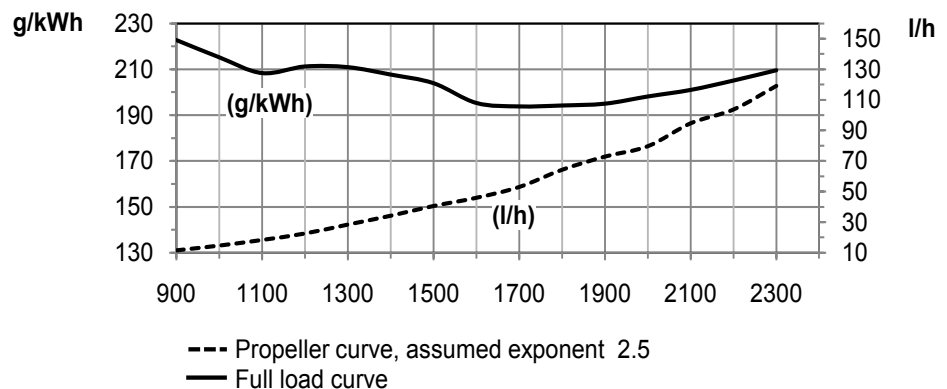
Torque

(Nm / 9.81 = kpm)



Spec. fuel consumption

(g/kWh / 1.36 = g/hph)



--- Propeller curve, assumed exponent 2.5
— Full load curve



Technical data

DI13 077M, 515 kW / 700 hp - With heat exchanger (engine ref. 03-41)

Emission compliance	Fuel injection system	Rating
EU Stage IIIA, US Tier 2, IMO Tier II	PDE	Patrol craft long

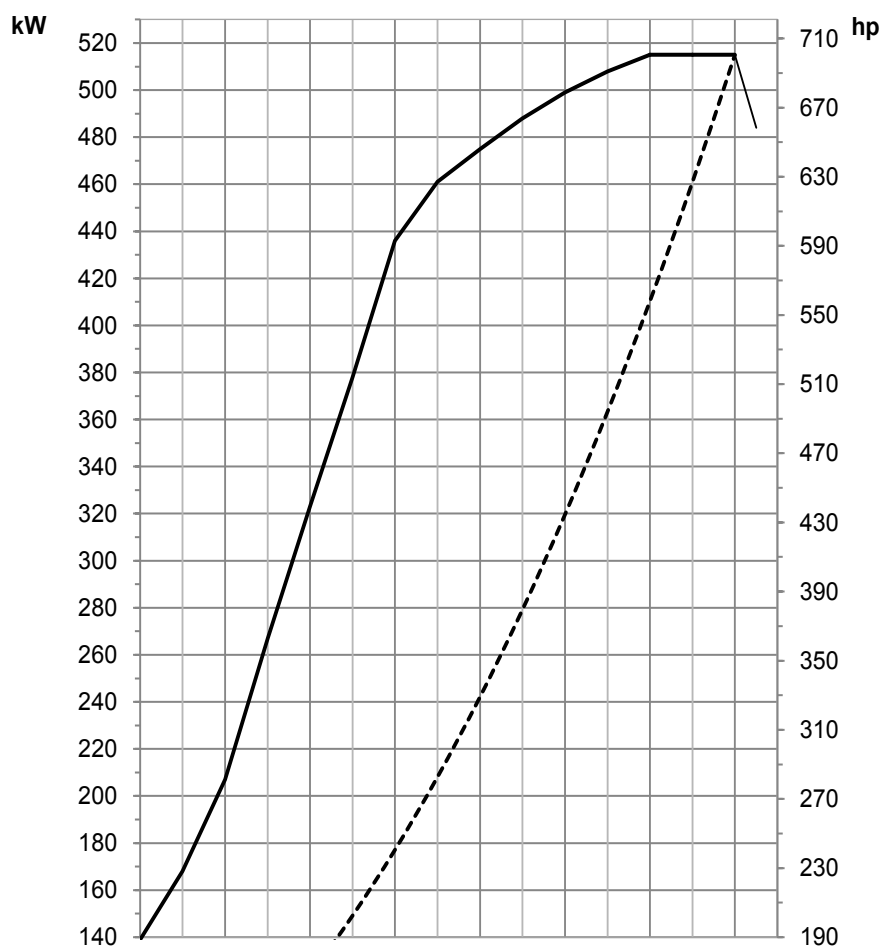
	Engine speed (rpm)						Unit
	1200	1500	1800	2100	2200	2300	
Gross power							
Full load curve	267	436	488	515	515	515	kW
	363	593	664	700	700	700	hp
Propeller curve (assumed exponent 2.5)	101	177	279	410	461	515	kW
	138	241	379	558	627	700	hp
Gross torque	2125	2776	2589	2342	2235	2138	Nm
Spec. fuel consumption							
full load	210	199	199	210	212	217	g/kWh
3/4 load	201	201	200	209	207	221	g/kWh
1/2 load	199	206	207	213	211	235	g/kWh
Propeller curve (assumed exponent 2.5)	24	43	69	102	115	133	l/h
Heat rejection							
to coolant	203	292	330	373	379	394	kW
to exhaust gas	190	294	323	382	388	407	kW
to surrounding air	13	21	23	26	26	27	kW
Air consumption	17	29	38	43	44	46	kg/min
Pressure in intake manifold	1.1	2.0	2.3	2.2	2.2	2.2	Bar
Exhaust flow	17	30	40	45	46	47	kg/min
Exhaust temperature	606	548	470	489	487	495	°C



DI13 077M, 515 kW / 700 hp - With heat exchanger (engine ref. 03-41)

Power

(kW x 1.36 = hp)



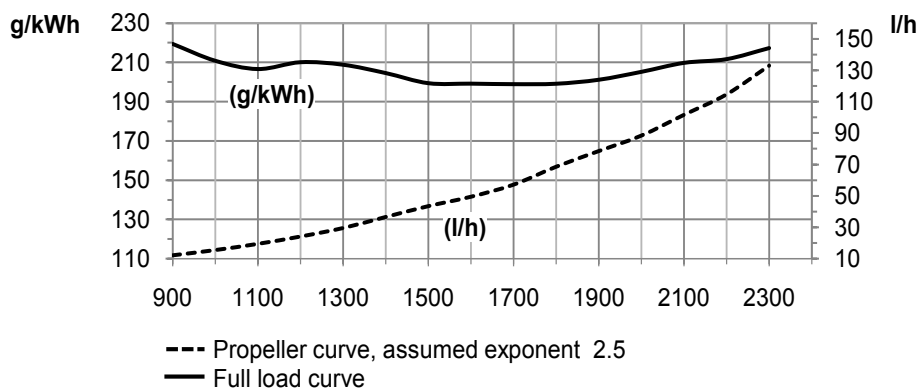
Torque

(Nm / 9.81 = kpm)



Spec. fuel consumption

(g/kWh / 1.36 = g/hph)





Technical data

DI13 077M, 551 kW / 750 hp - With heat exchanger (engine ref. 03-42)

Emission compliance	Fuel injection system	Rating
EU Stage IIIA, US Tier 2, IMO Tier II	PDE	Patrol craft short

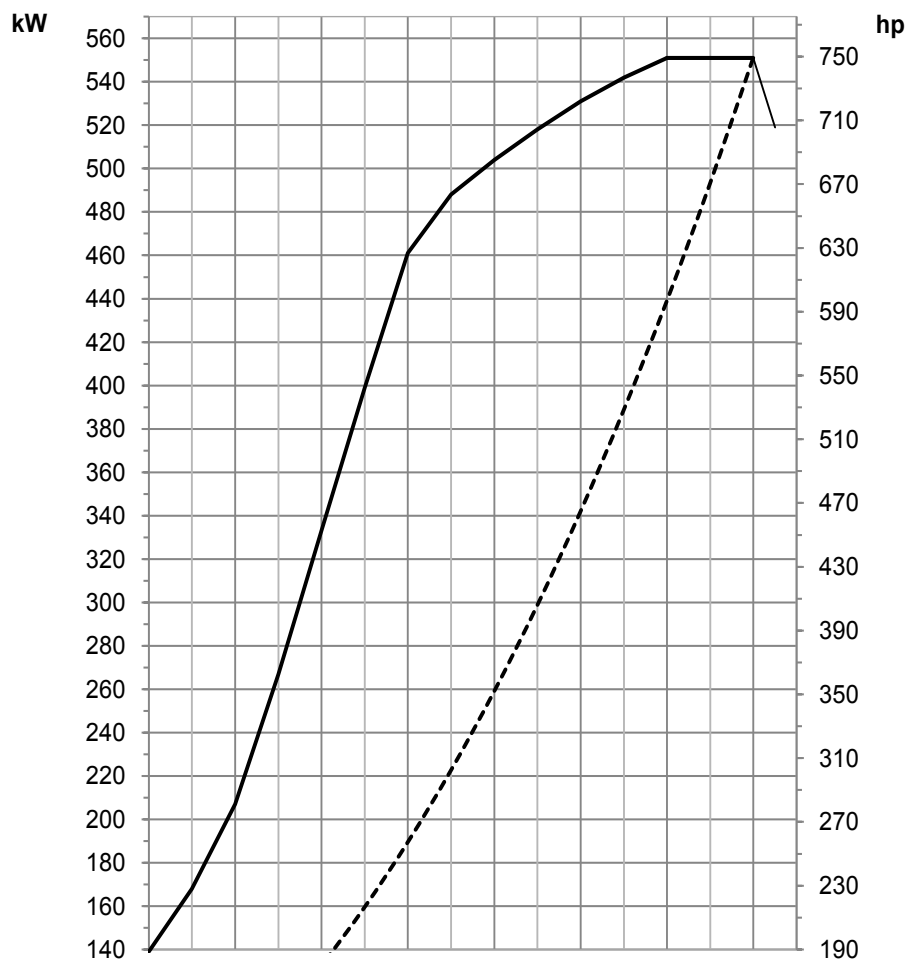
	Engine speed (rpm)						Unit
	1200	1500	1800	2100	2200	2300	
Gross power							
Full load curve	267	461	518	551	551	551	kW
	363	627	704	750	750	750	hp
Propeller curve (assumed exponent 2.5)	108	189	299	439	493	551	kW
	147	257	406	597	671	750	hp
Gross torque	2125	2935	2748	2506	2392	2288	Nm
Spec. fuel consumption							
full load	210	201	202	211	215	220	g/kWh
3/4 load	201	200	199	209	208	221	g/kWh
1/2 load	199	205	207	212	210	232	g/kWh
Propeller curve (assumed exponent 2.5)	26	46	73	109	123	144	l/h
Heat rejection							
to coolant	203	313	353	402	413	429	kW
to exhaust gas	190	313	361	413	427	446	kW
to surrounding air	13	22	25	28	28	29	kW
Air consumption	17	30	39	45	46	47	kg/min
Pressure in intake manifold	1.1	2.1	2.4	2.4	2.3	2.3	Bar
Exhaust flow	17	32	41	47	48	49	kg/min
Exhaust temperature	606	554	509	508	512	520	°C



DI13 077M, 551 kW / 750 hp- With heat exchanger (engine ref. 03-42)

Power

(kW x 1.36 = hp)



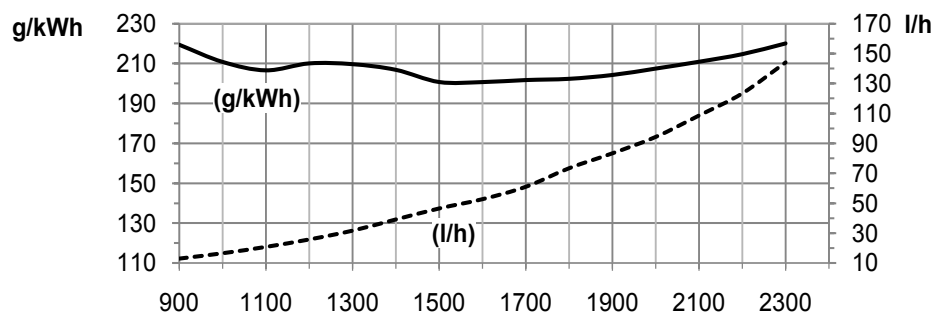
Torque

(Nm / 9.81 = kpm)



Spec. fuel consumption

(g/kWh / 1.36 = g/hph)



--- Propeller curve, assumed exponent 2.5
— Full load curve



Technical data

DI13 071M, 294 kW / 400 hp - With keel cooling, single circuit (engine ref. 03-11)

Emission compliance	Fuel injection system	Rating
EU Stage IIIA, US Tier 2, IMO Tier II	PDE	ICFN, Continuous service

	Engine speed (rpm)				Unit
	1200	1500	1700	1800	
Gross power					
Full load curve	232	279	294	294	kW
	316	380	400	400	hp
Propeller curve (assumed exponent 2.5)	107	186	255	294	kW
	145	253	347	400	hp
Gross torque	1850	1779	1651	1560	Nm
Spec. fuel consumption					
full load	201	197	205	205	g/kWh
3/4 load	207	208	204	219	g/kWh
1/2 load	212	212	209	229	g/kWh
Propeller curve (assumed exponent 2.5)	27	47	62	72	l/h
Heat rejection					
to coolant*	164	182	208	208	kW
to exhaust gas	156	188	208	208	kW
to surrounding air	11	13	14	14	kW
Air consumption	16	23	28	29	kg/min
Air temperature					
before charge air cooler	131	150	168	167	°C
after charge air cooler	71	76	81	81	°C
Pressure in intake manifold	1.2	1.6	1.8	1.7	Bar
Exhaust flow	17	24	29	30	kg/min
Exhaust temperature	519	460	422	411	°C

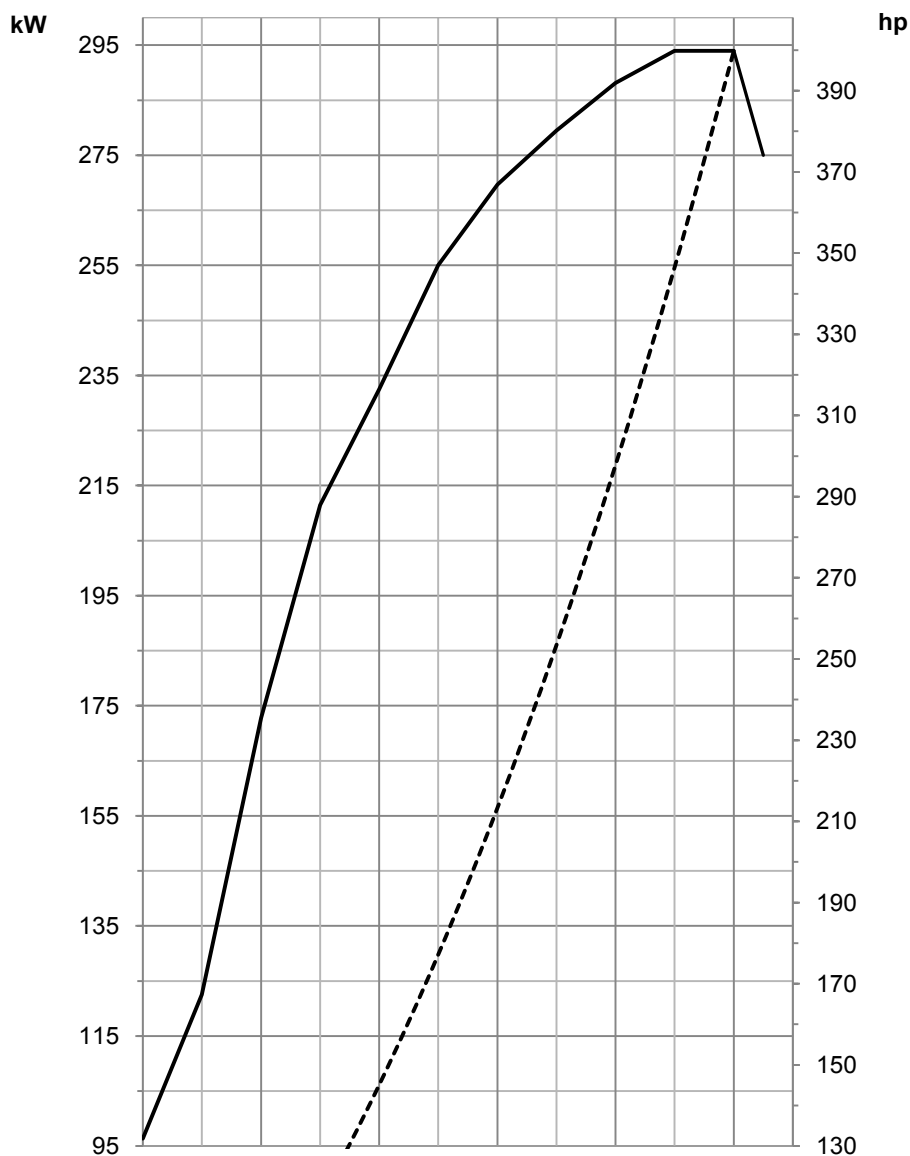
*Including charge air



DI13 071M, 294 kW / 400 hp - With keel cooling, single circuit (engine ref. 03-11)

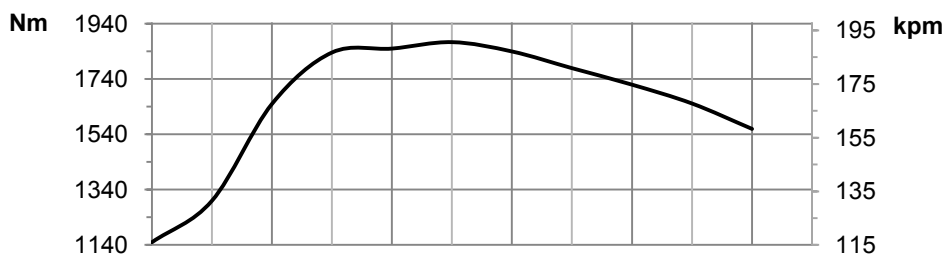
Power

(kW x 1.36 = hp)



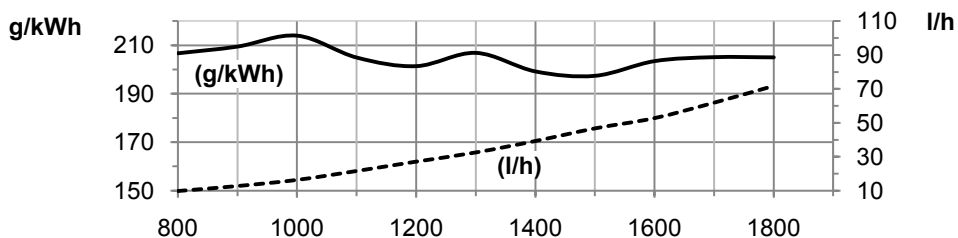
Torque

(Nm / 9.81 = kpm)



Spec. fuel consumption

(g/kWh / 1.36 = g/hph)



----- Propeller curve, assumed exponent 2.5
— Full load curve



Technical data

DI13 071M, 331 kW / 450 hp - With keel cooling, single circuit (engine ref. 03-12)

Emission compliance	Fuel injection system	Rating
EU Stage IIIA, US Tier 2, IMO Tier II	PDE	ICFN, Continuous service

	Engine speed (rpm)				Unit
	1200	1500	1700	1800	
Gross power					
Full load curve	262	315	331	331	kW
	356	428	450	450	hp
Propeller curve (assumed exponent 2.5)	120	210	287	331	kW
	163	285	390	450	hp
Gross torque	2085	2003	1859	1756	Nm
Spec. fuel consumption					
full load	201	196	204	204	g/kWh
3/4 load	204	204	204	213	g/kWh
1/2 load	211	211	207	228	g/kWh
Propeller curve (assumed exponent 2.5)	30	52	70	81	l/h
Heat rejection					
to coolant*	184	204	232	233	kW
to exhaust gas	175	210	232	234	kW
to surrounding air	13	15	16	16	kW
Air consumption	18	25	30	31	kg/min
Air temperature					
before charge air cooler	146	166	183	183	°C
after charge air cooler	74	80	85	85	°C
Pressure in intake manifold	1.5	1.8	2.0	1.9	Bar
Exhaust flow	19	26	31	32	kg/min
Exhaust temperature	530	467	437	430	°C

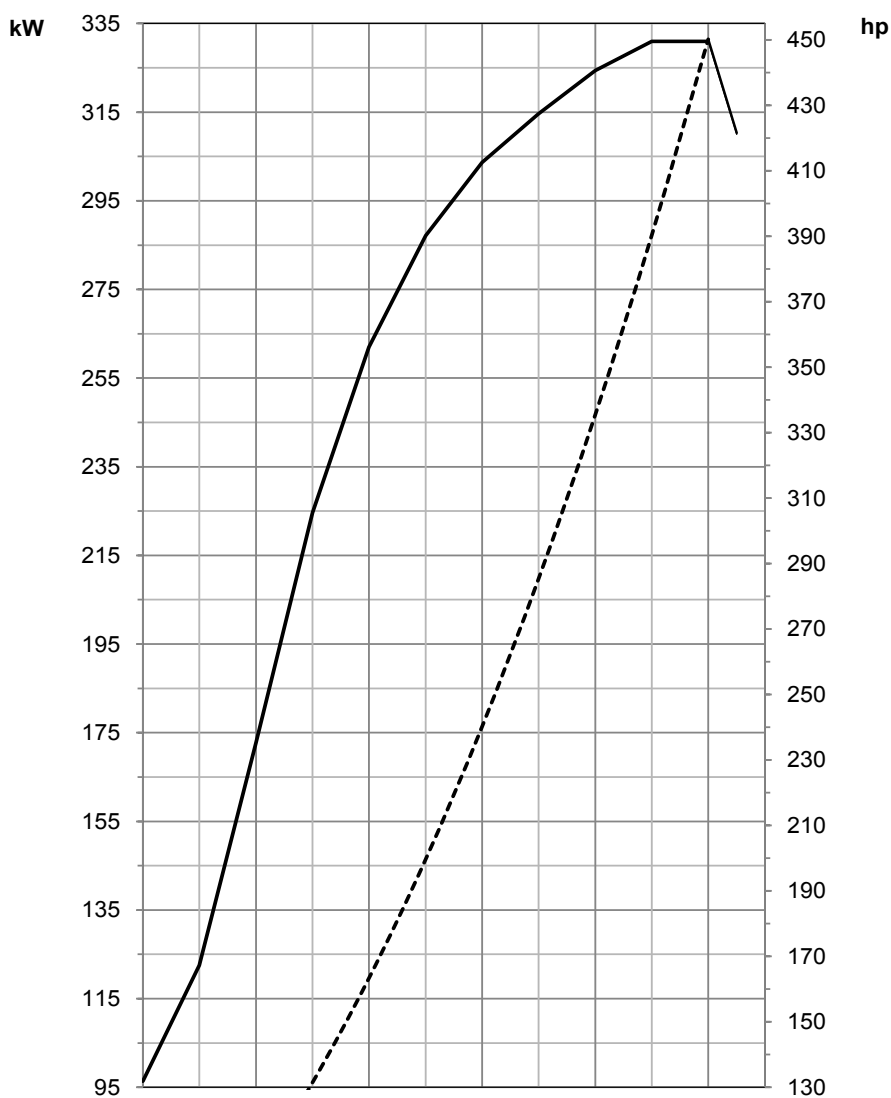
*Including charge air



DI13 071M, 331 kW / 450 hp- With keel cooling, single circuit (engine ref. 03-12)

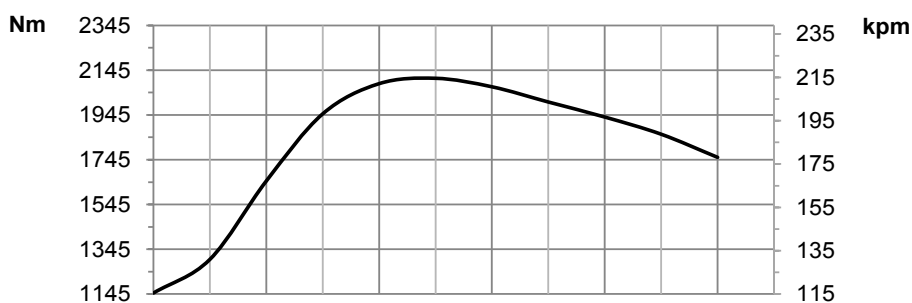
Power

(kW x 1.36 = hp)



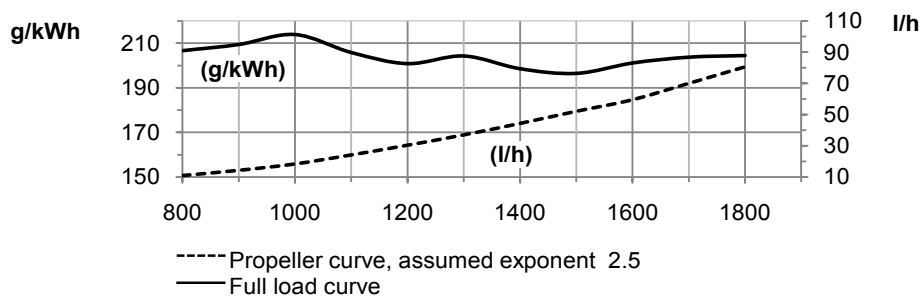
Torque

(Nm / 9.81 = kpm)



Spec. fuel consumption

(g/kWh / 1.36 = g/hph)



5_A



Technical data

DI13 071M, 368 kW / 500 hp - With keel cooling, single circuit (engine ref. 03-13)

Emission compliance	Fuel injection system	Rating
EU Stage IIIA, US Tier 2, IMO Tier II	PDE	ICFN, Continuous service

	Engine speed (rpm)				Unit
	1200	1500	1700	1800	
Gross power					
Full load curve	292	350	368	368	kW
	396	476	500	500	hp
Propeller curve (assumed exponent 2.5)	134	233	319	368	kW
	182	317	434	500	hp
Gross torque	2320	2227	2067	1952	Nm
Spec. fuel consumption					
full load	200	197	203	206	g/kWh
3/4 load	201	199	204	208	g/kWh
1/2 load	210	211	205	227	g/kWh
Propeller curve (assumed exponent 2.5)	34	57	78	90	l/h
Heat rejection					
to coolant*	205	231	255	262	kW
to exhaust gas	193	233	255	262	kW
to surrounding air	14	16	18	18	kW
Air consumption	19	27	31	32	kg/min
Air temperature					
before charge air cooler	161	182	196	199	°C
after charge air cooler	77	84	88	89	°C
Pressure in intake manifold	1.7	2.1	2.2	2.1	Bar
Exhaust flow	20	28	33	34	kg/min
Exhaust temperature	535	473	455	452	°C

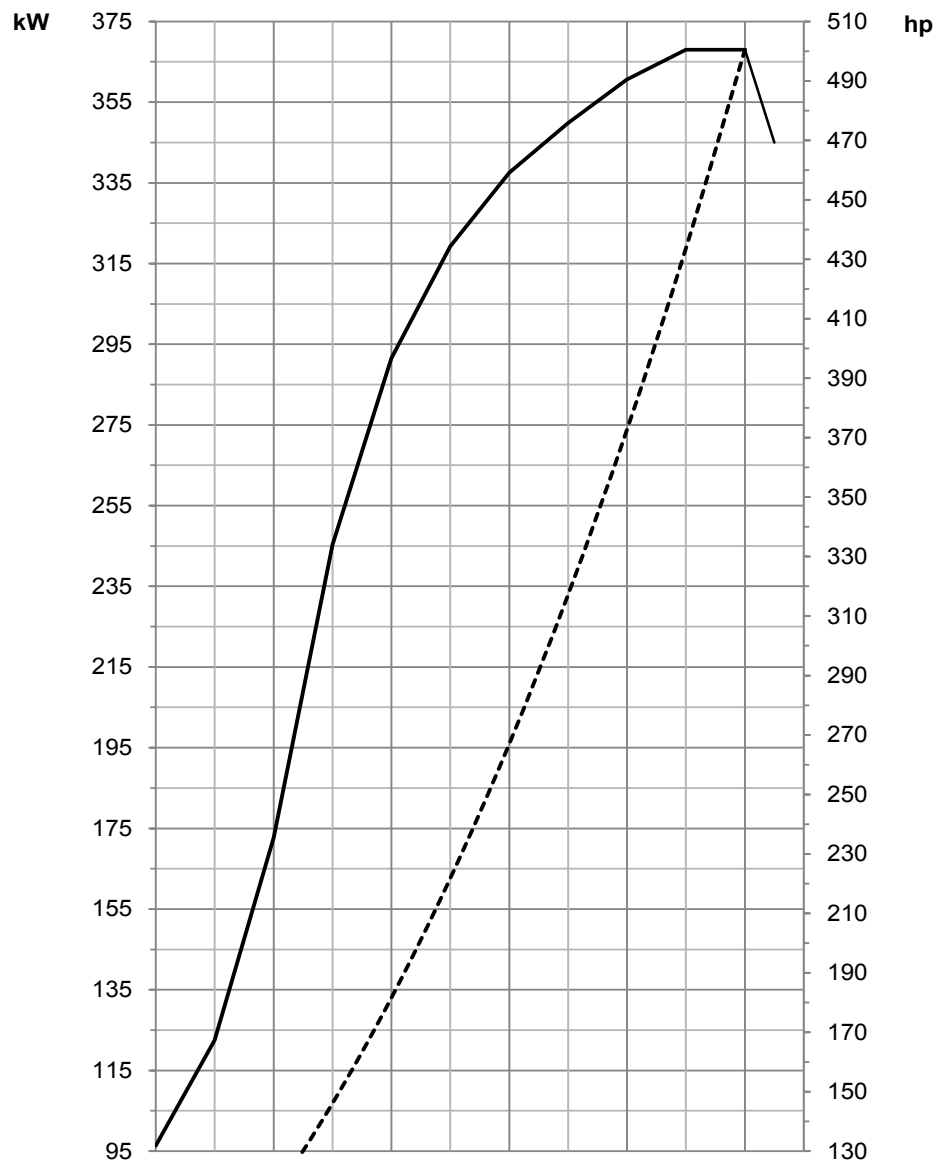
*Including charge air



DI13 071M, 368 kW / 500 hp - With keel cooling, single circuit (engine ref. 03-13)

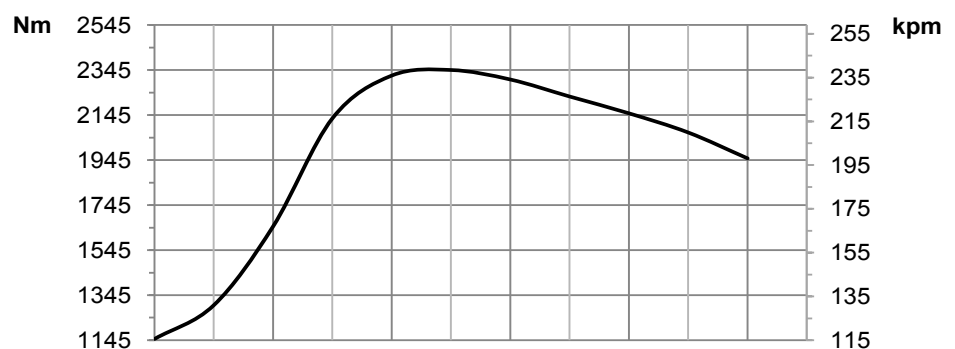
Power

(kW x 1.36 = hp)

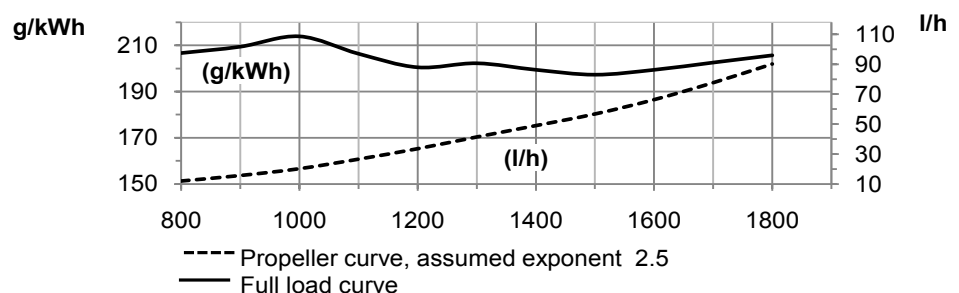


Torque

(Nm / 9.81 = kpm)



Spec. fuel consumption





Technical data

DI13 073M, 331 kW / 450 hp - With keel cooling, single circuit (engine ref. 03-31)

Emission compliance:	Fuel injection system	Rating
EU Stage IIIA, US Tier 2, IMO Tier II	PDE	IFN, Intermittent service

	Engine speed (rpm)					Unit
	1200	1500	1800	2000	2100	
Gross power						
Full load curve	211	284	317	331	331	kW
	287	386	431	450	450	hp
Propeller curve (assumed exponent 2.5)	82	143	225	293	331	kW
	111	194	306	398	450	hp
Gross torque	1680	1808	1682	1580	1505	Nm
Spec. fuel consumption						
full load	197	207	200	205	224	g/kWh
3/4 load	197	206	201	206	229	g/kWh
1/2 load	200	209	209	217	237	g/kWh
Propeller curve (assumed exponent 2.5)	20	35	54	72	88	l/h
Heat rejection						
to coolant*	147	202	214	233	269	kW
to exhaust gas	133	207	218	236	274	kW
to surrounding air	10	14	15	16	18	kW
Air consumption	14	23	28	32	35	kg/min
Air temperature						
before charge air cooler	105	150	159	169	188	°C
after charge air cooler	66	75	78	81	87	°C
Pressure in intake manifold	0.9	1.5	1.6	1.7	1.8	Bar
Exhaust flow	14	24	29	33	36	kg/min
Exhaust temperature	526	501	438	423	448	°C

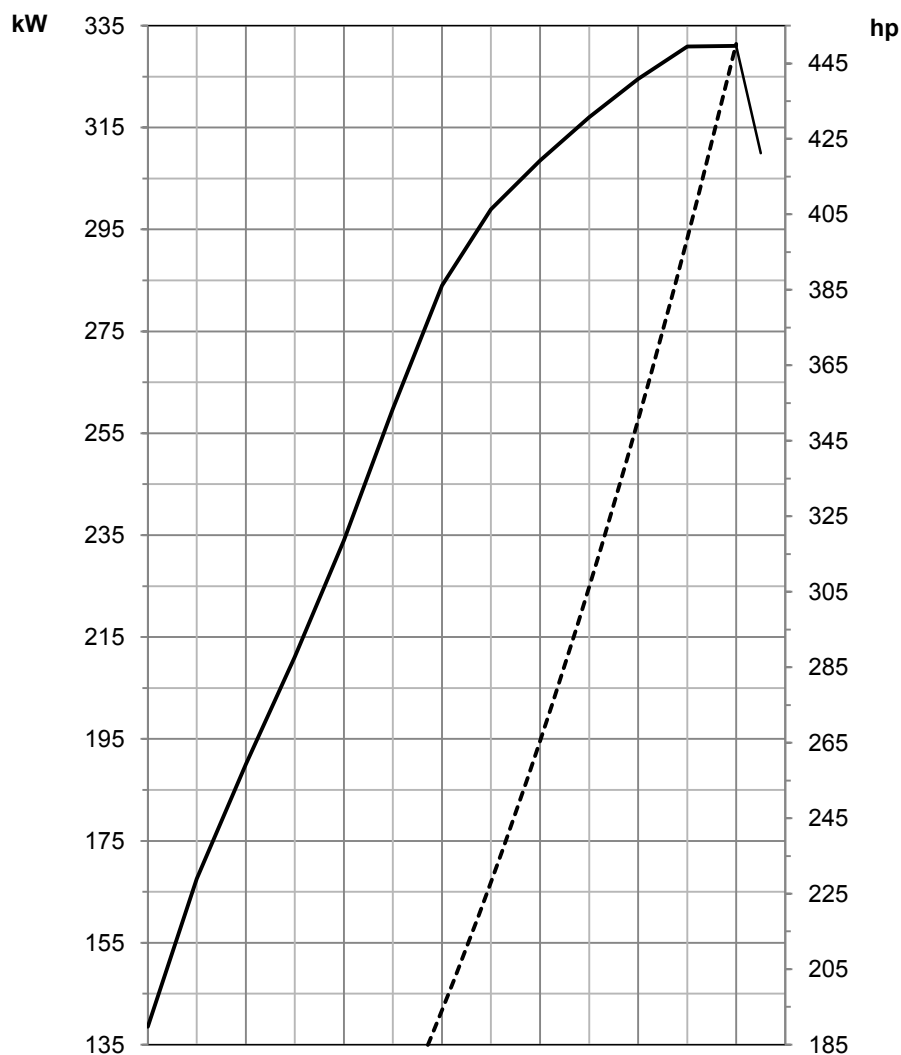
*Including charge air



DI13 073M, 331 kW / 450 hp - With keel cooling, single circuit (engine ref. 03-31)

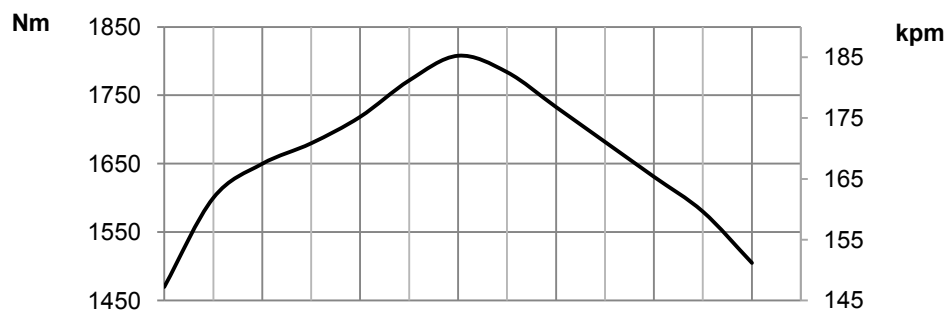
Power

(kW x 1.36 = hp)



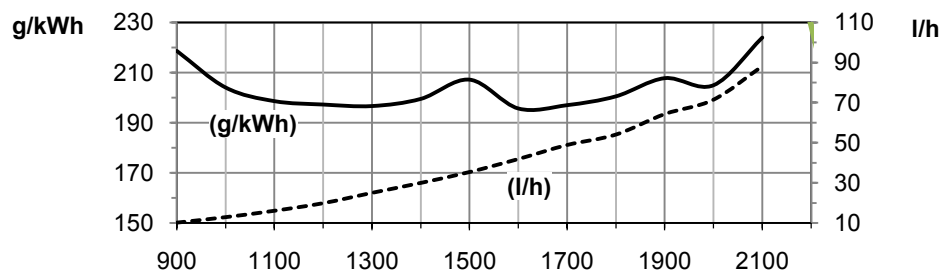
Torque

(Nm / 9.81 = kpm)



Spec. fuel consumption

(g/kWh / 1.36 = g/hph)



----- Propeller curve, assumed exponent 2.5
— Full load curve



Technical data

DI13 073M, 368 kW / 500 hp - With keel cooling, single circuit (engine ref. 03-32)

Emission compliance	Fuel injection system	Rating
EU Stage IIIA, US Tier 2, IMO Tier II	PDE	IFN, Intermittent service

	Engine speed (rpm)					Unit
	1200	1500	1800	2000	2100	
Gross power						
Full load curve	235	315	352	368	368	kW
	320	429	479	500	500	hp
Propeller curve (assumed exponent 2.5)	91	159	250	326	368	kW
	124	216	340	443	500	hp
Gross torque	1870	2006	1868	1757	1673	Nm
Spec. fuel consumption						
full load	198	205	199	206	221	g/kWh
3/4 load	197	206	200	206	226	g/kWh
1/2 load	199	208	207	213	234	g/kWh
Propeller curve (assumed exponent 2.5)	20	35	54	72	88	l/h
Heat rejection						
to coolant*	162	221	234	260	293	kW
to exhaust gas	150	226	238	265	298	kW
to surrounding air	11	15	17	18	19	kW
Air consumption	15	24	30	34	35	kg/min
Air temperature						
before charge air cooler	117	164	171	184	200	°C
after charge air cooler	67	78	81	85	90	°C
Pressure in intake manifold	1.0	1.7	1.8	1.9	1.9	Bar
Exhaust flow	15	25	31	35	37	kg/min
Exhaust temperature	544	506	447	445	471	°C

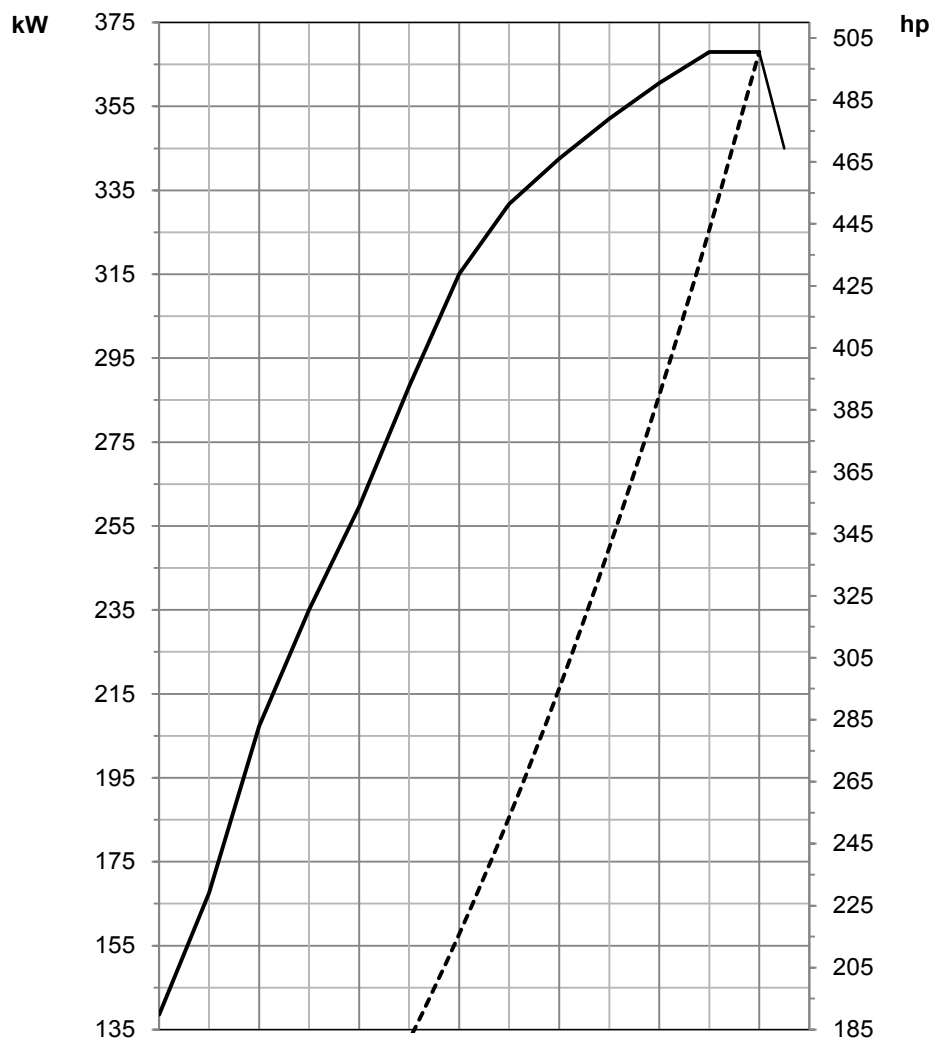
*Including charge air



DI13 073M, 368 kW / 500 hp - With keel cooling, single circuit (engine ref. 03-32)

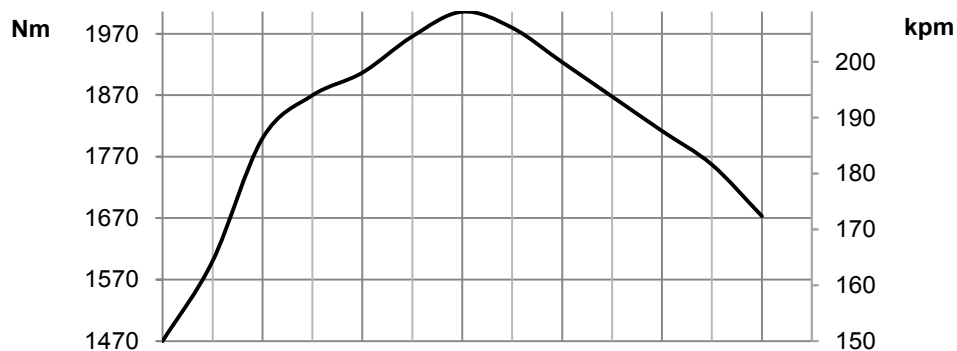
Power

(kW x 1.36 = hp)



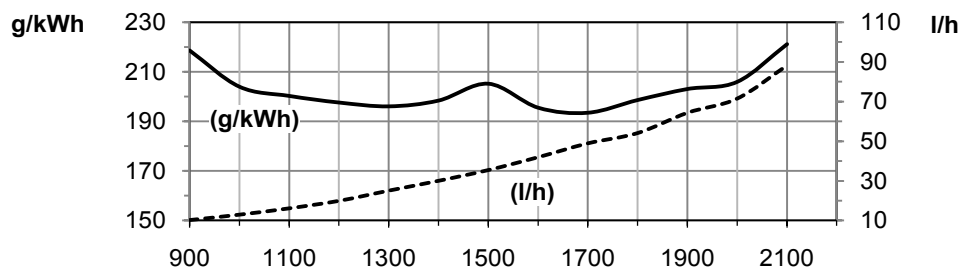
Torque

(Nm / 9.81 = kpm)



Spec. fuel consumption

(g/kWh / 1.36 = g/hph)



----- Propeller curve, assumed exponent 2.5
— Full load curve

5_A



Technical data

DI13 073M, 405 kW / 550 hp - With keel cooling, single circuit (engine ref. 03-33)

Emission compliance	Fuel injection system	Rating
EU Stage IIIA, US Tier 2, IMO Tier II	PDE	IFN, Intermittent service

	Engine speed (rpm)					Unit
	1200	1500	1800	2000	2100	
Gross power						
Full load curve	251	345	387	405	405	kW
	342	469	526	550	550	hp
Propeller curve (assumed exponent 2.5)	100	175	275	358	405	kW
	136	238	375	488	550	hp
Gross torque	2000	2197	2053	1934	1842	Nm
Spec. fuel consumption						
full load	198	205	195	208	219	g/kWh
3/4 load	197	206	200	205	225	g/kWh
1/2 load	198	207	204	210	232	g/kWh
Propeller curve (assumed exponent 2.5)	20	35	54	88	88	l/h
Heat rejection						
to coolant*	175	243	249	290	317	kW
to exhaust gas	161	246	251	295	322	kW
to surrounding air	12	17	18	20	21	kW
Air consumption	16	26	31	35	36	kg/min
Air temperature						
before charge air cooler	124	177	179	199	210	°C
after charge air cooler	68	81	83	89	92	°C
Pressure in intake manifold	1.1	2.0	1.9	2.0	2.0	Bar
Exhaust flow	16	27	32	36	38	kg/min
Exhaust temperature	552	513	453	471	490	°C

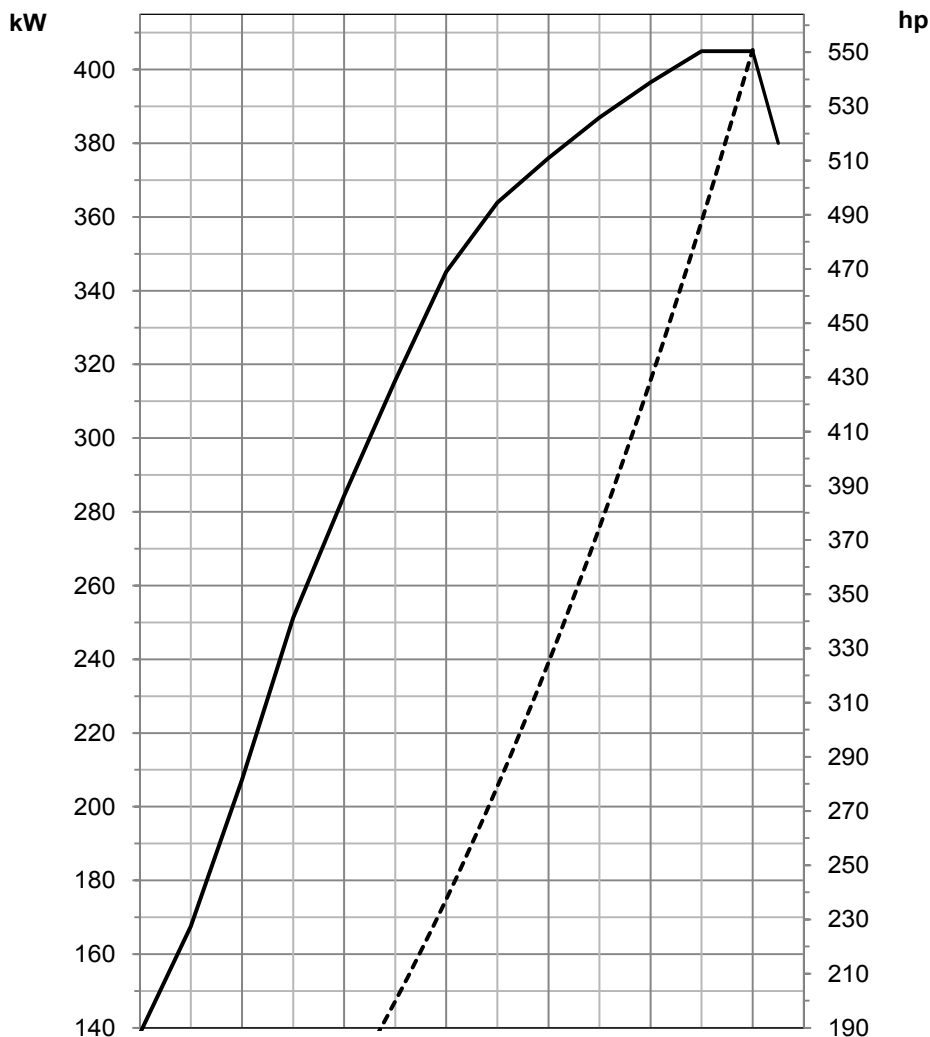
*Including charge air



DI13 073M, 405 kW / 550 hp - With keel cooling, single circuit (engine ref. 03-33)

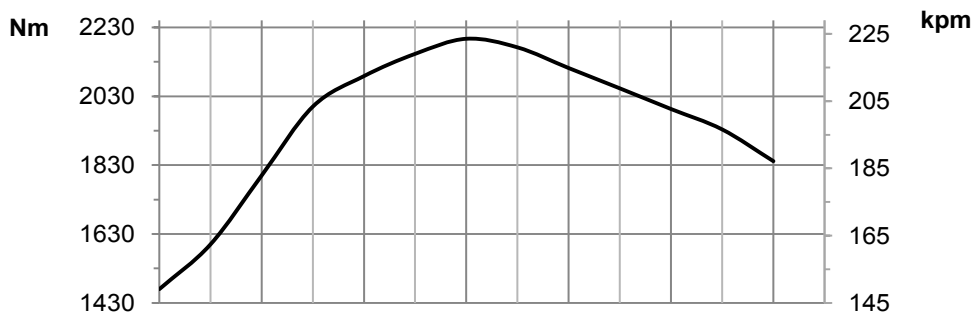
Power

(kW x 1.36 = hp)



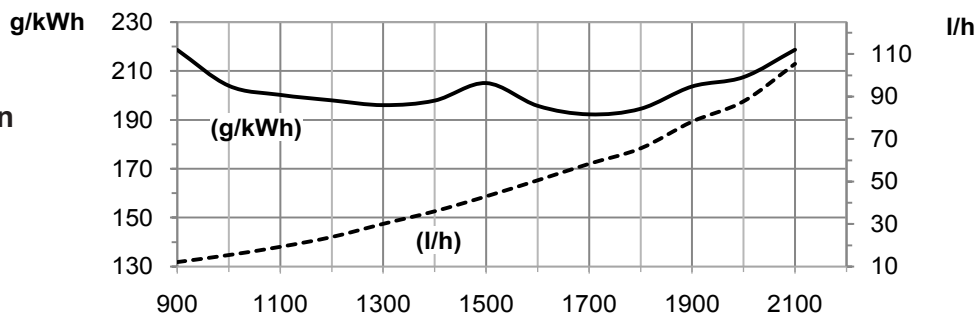
Torque

(Nm / 9.81 = kpm)



Spec. fuel consumption

(g/kWh / 1.36 = g/hph)



----- Propeller curve, assumed exponent 2.5
—— Full load curve

5_A



Basic dimensions

The basic dimensions are indicated with coordinates. The coordinate system is three dimensional and consists of three planes at straight angles to each other; x, y and z. The dimensions are indicated in mm from crankshaft centre.

DI13 070/078M - With heat exchanger

1 Air intake (Ø 150 mm)

1	x	+121
	y	-129
	z	+537

2 Exhaust outlet (Ø 117.35 mm)

2	x	-94
	y	+256
	z	+537

3 Sea water inlet (Ø 50 mm)

3	x	0
	y	+291
	z	+132

4 Sea water outlet (Ø 50 mm)

4	x	-428
	y	+452
	z	+315

5 Coolant drain (fresh water)

6 Fresh water filling

7 Fuel inlet (union nut M16x1.5)

7	x	-493
	y	-313
	z	+90

8 Fuel return (union nut M16x1.5)

8	x	-543
	y	-313
	z	+90

9 Oil filling in valve cover
(optional position)

10 Oil filling /dipstick

11 Oil drain plug

12 Connection from cab heater (M22x1.5)

12	x	-1016
	y	+347
	z	+90

13 Connection to cab heater (M18x1.5)
(remove lid to access)

13	x	-1229
	y	+108
	z	+396

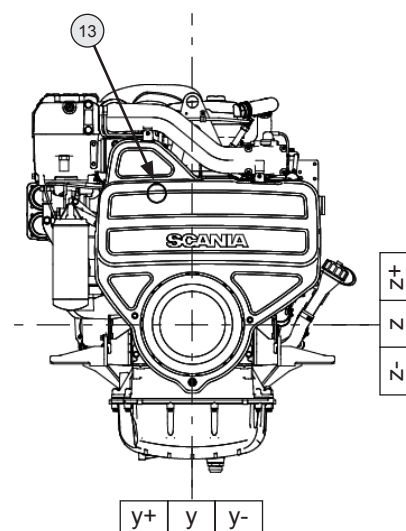
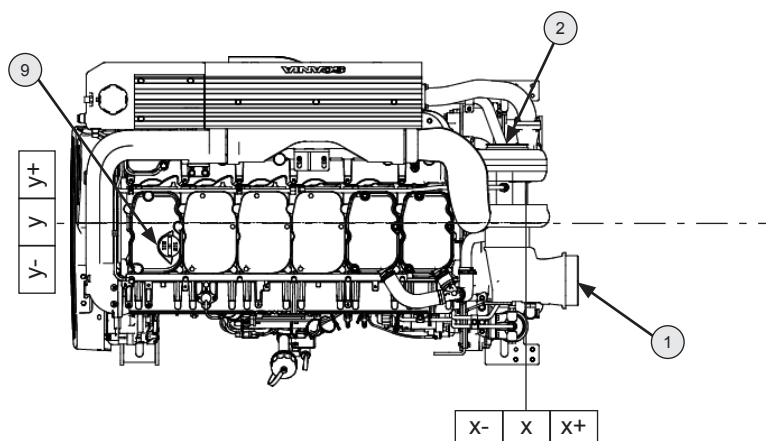
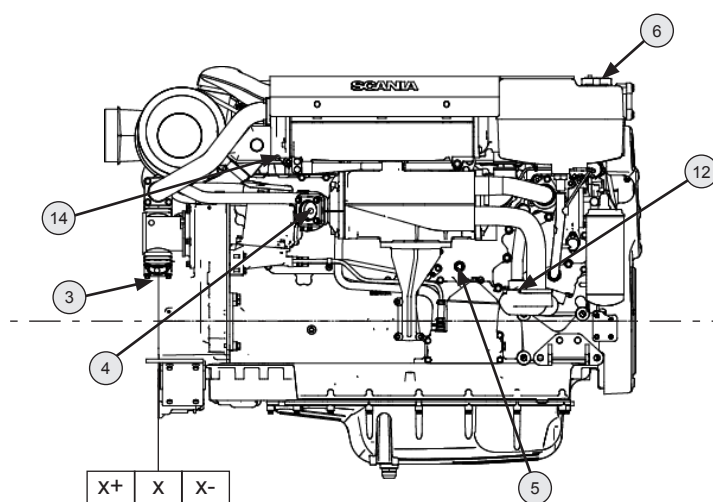
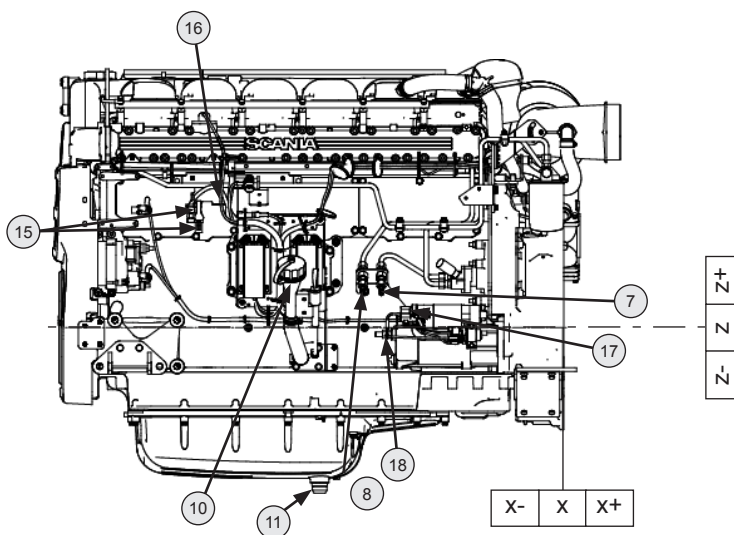
14 Sacrificial anode (2x)

15 Customer interface EMS

16 Diagnostic socket

17 Battery connection + (M10)

18 Battery connection - (M12)



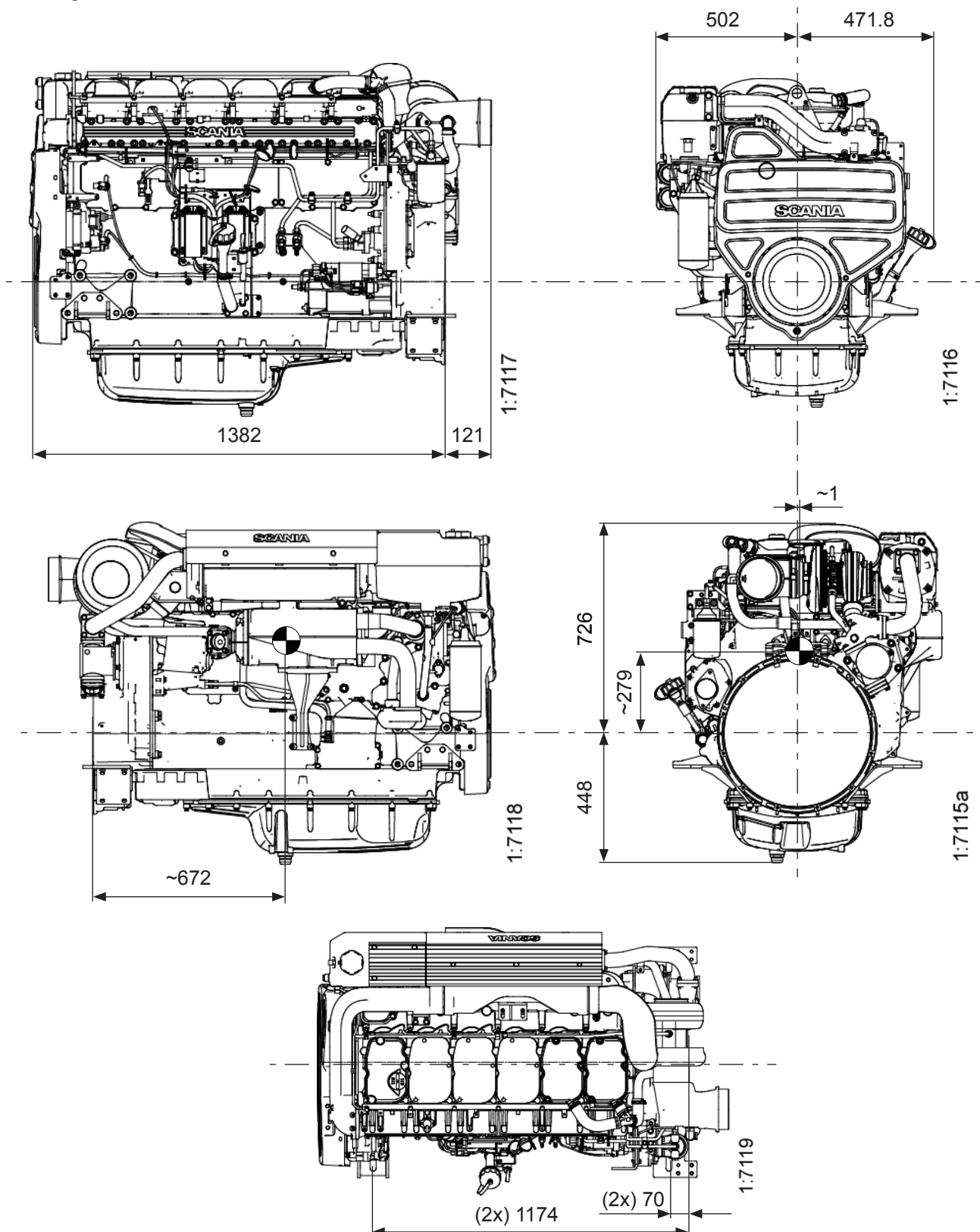


Dimensional drawings

All sketches are only intended as general sales information and must not be used for any installation purposes. The values for centre of gravity applies for engines with standard equipment including coolant. All dimensions are indicated in mm.

DI13 070/078M - With heat exchanger

Drawing no 1 866 386



5_A



Basic dimensions

The basic dimensions are indicated with coordinates. The coordinate system is three dimensional and consists of three planes at straight angles to each other; x, y and z. The dimensions are indicated in mm from crankshaft centre.

DI13 072M - With heat exchanger

1 Air intake (Ø 150 mm)

1	x	+154
	y	-175
	z	+528

2 Exhaust outlet (Ø 127 mm)

2	x	-61
	y	+238
	z	+528

3 Sea water inlet (Ø 50 mm)

3	x	0
	y	+291
	z	+132

4 Sea water outlet (Ø 50 mm)

4	x	-428
	y	+452
	z	+315

5 Coolant drain (fresh water)

6 Fresh water filling

7 Fuel inlet (union nut M16x1.5)

7	x	-493
	y	-313
	z	+90

8 Fuel return (union nut M16x1.5)

8	x	-543
	y	-313
	z	+90

9 Oil filling in valve cover
(optional position)

10 Oil filling /dipstick

11 Oil drain plug

12 Connection from cab heater (M22x1.5)

12	x	-1016
	y	+347
	z	+90

13 Connection to cab heater (M18x1.5)
(remove lid to access)

13	x	-1229
	y	+108
	z	+396

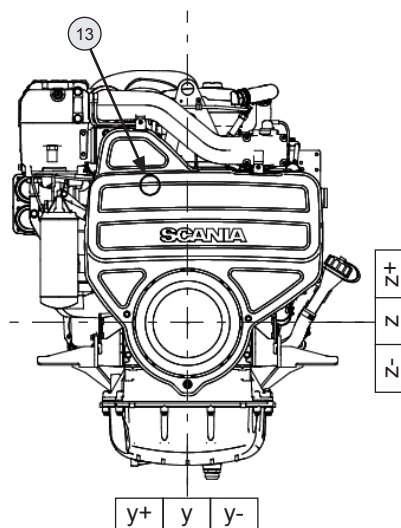
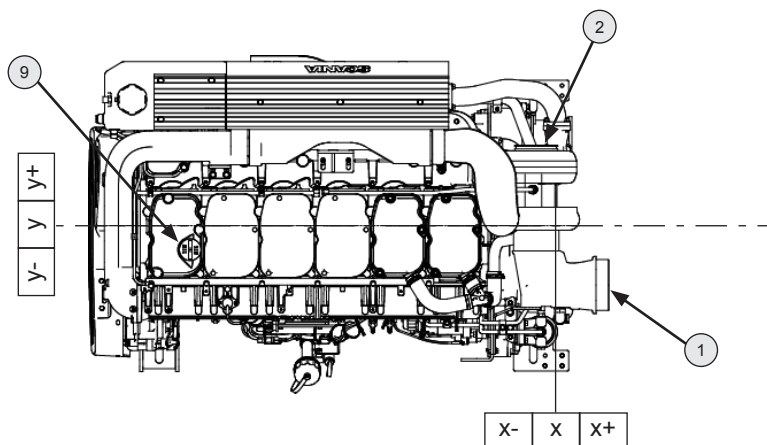
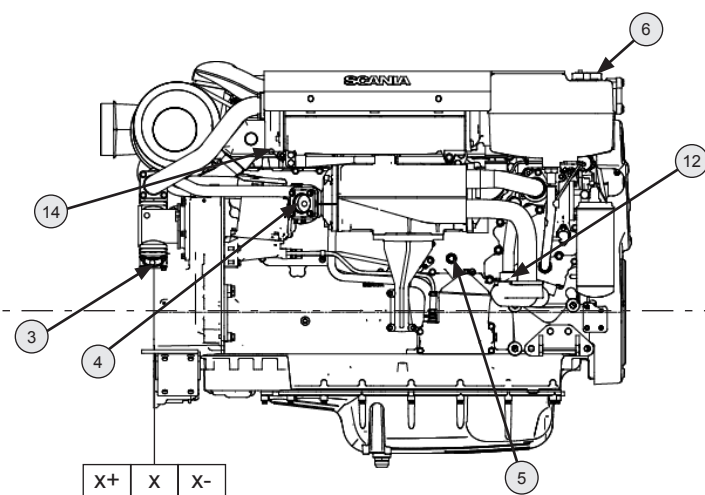
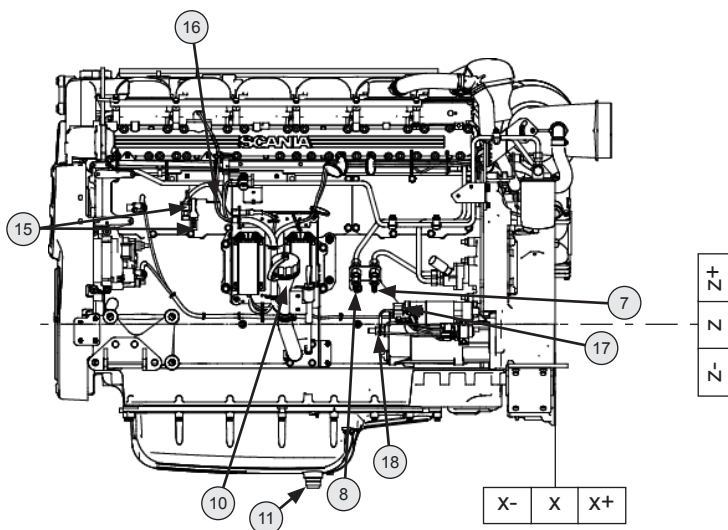
14 Sacrificial anode (2x)

15 Customer interface EMS

16 Diagnostic socket

17 Battery connection + (M10)

18 Battery connection - (M12)



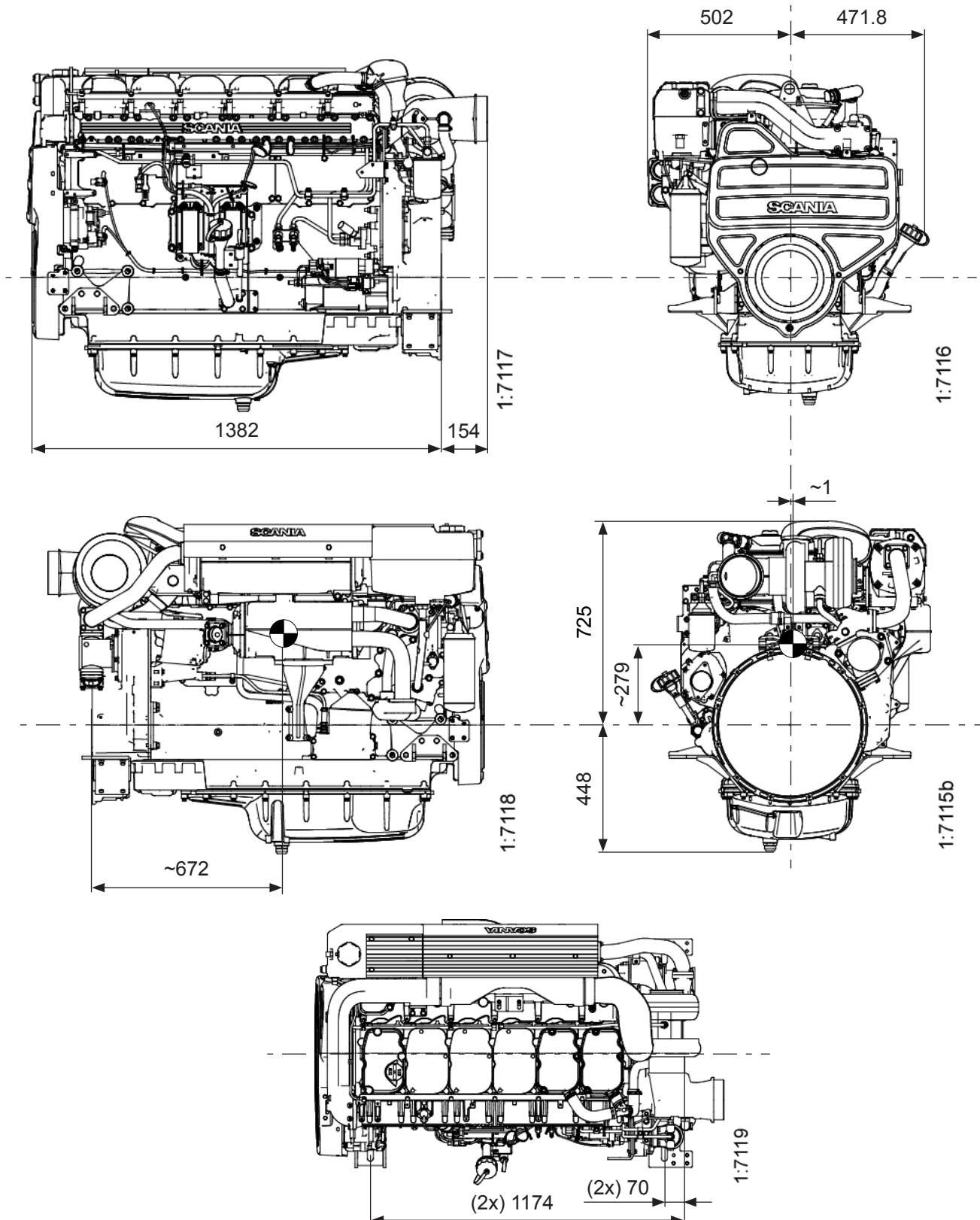


Dimensional drawings

All sketches are only intended as general sales information and must not be used for any installation purposes. The values for centre of gravity applies for engines with standard equipment including coolant. All dimensions are indicated in mm.

DI13 072M - With heat exchanger

Drawing no 1 866 386



5_A



Basic dimensions

The basic dimensions are indicated with coordinates. The coordinate system is three dimensional and consists of three planes at straight angles to each other; x, y and z. The dimensions are indicated in mm from crankshaft centre.

DI13 077M - With heat exchanger

1 Air intake (Ø 150 mm)

1	x	+154
	y	-175
	z	+528

2 Exhaust outlet (Ø 127 mm)

2	x	-62
	y	+297
	z	+528

3 Sea water inlet (Ø 50 mm)

3	x	0
	y	+291
	z	+132

4 Sea water outlet (Ø 50 mm)

4	x	-428
	y	+452
	z	+315

5 Coolant drain (fresh water)

6 Fresh water filling

7 Fuel inlet (union nut M16x1.5)

7	x	-493
	y	-313
	z	+90

8 Fuel return (union nut M16x1.5)

8	x	-543
	y	-313
	z	+90

9 Oil filling in valve cover
(optional position)

10 Oil filling /dipstick

11 Oil drain plug

12 Connection from cab heater (M22x1.5)

12	x	-1016
	y	+347
	z	+90

13 Connection to cab heater (M18x1.5)
(remove lid to access)

13	x	-1229
	y	+108
	z	+396

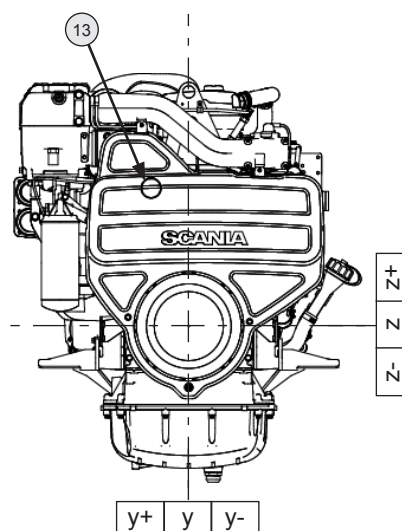
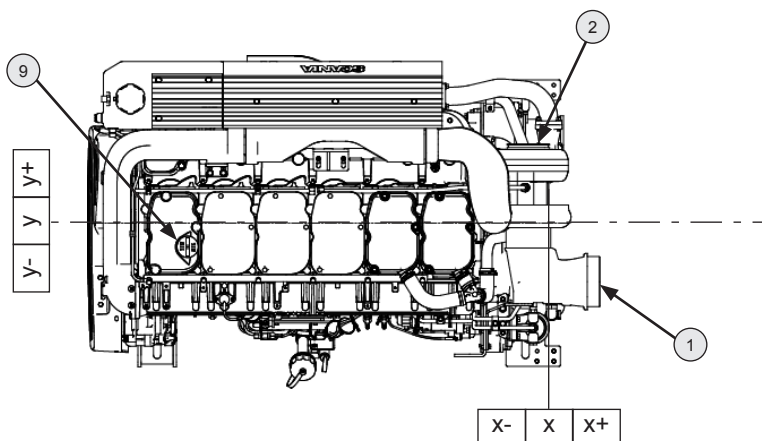
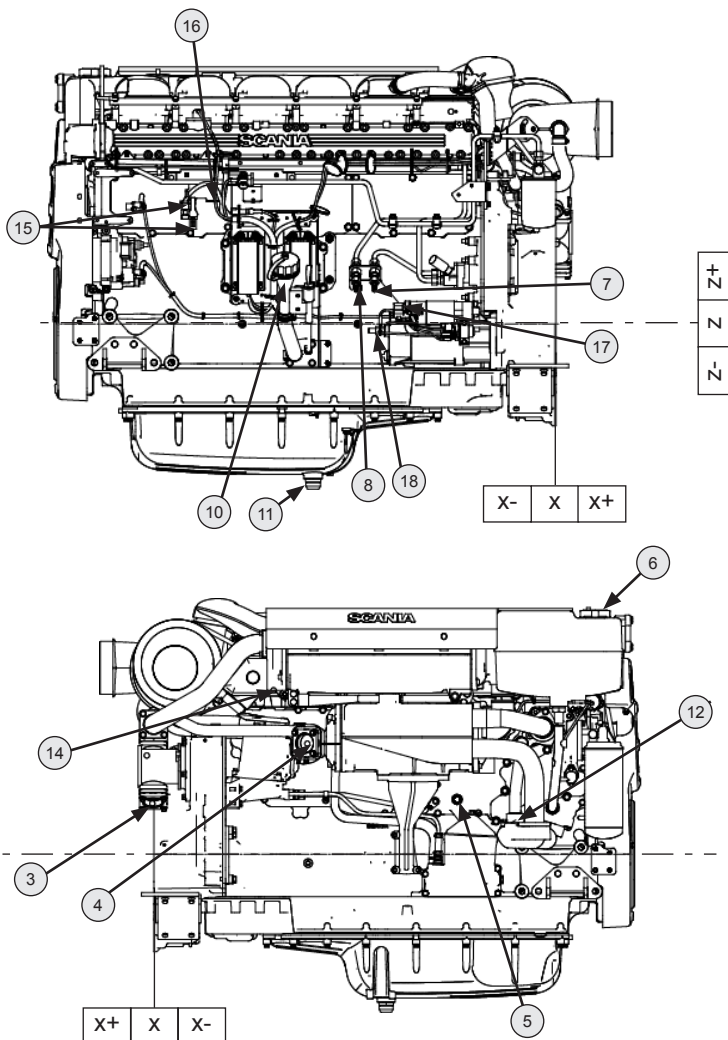
14 Sacrificial anode (2x)

15 Customer interface EMS

16 Diagnostic socket

17 Battery connection + (M10)

18 Battery connection - (M12)



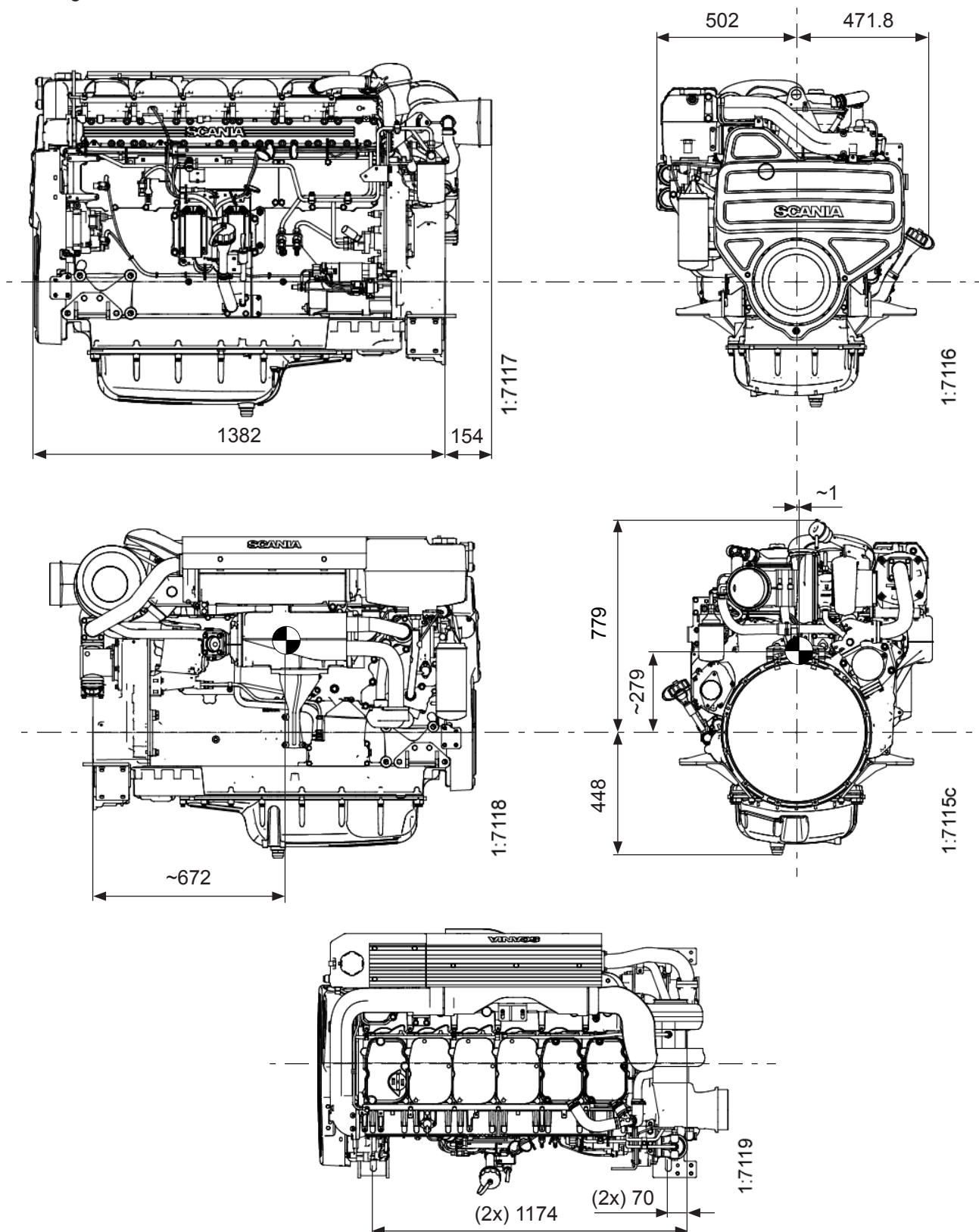


Dimensional drawings

All sketches are only intended as general sales information and must not be used for any installation purposes. The values for centre of gravity applies for engines with standard equipment including coolant. All dimensions are indicated in mm.

DI13 077M - With heat exchanger

Drawing no 1 866 386



5_A



Basic dimensions

The basic dimensions are indicated with coordinates. The coordinate system is three dimensional and consists of three planes at straight angles to each other; x, y and z. The dimensions are indicated in mm from crankshaft centre.

DI13 071/073M - With keel cooling, single circuit

- 1 Air intake (Ø 150 mm)

1	x	+121
	y	-129
	z	+537

- 2 Exhaust outlet (Ø 117.35 mm)

2	x	-94
	y	+256
	z	+537

- 3 Main coolant inlet (Ø 50 mm)

3	x	-1081
	y	+465
	z	+220

- 4 Main coolant outlet (Ø 50 mm)

4	x	-1357
	y	+430
	z	+382

- 5 Coolant drain/filling (fresh water)

- 6 Fuel inlet (union nut M16x1.5)

6	x	-493
	y	-313
	z	+90

- 7 Fuel return (union nut M16x1.5)

7	x	-543
	y	-313
	z	+90

- 8 Oil filling/dipstick

- 9 Oil drain plug

- 10 Connection from cab heater (M22x1.5)

10	x	-1016
	y	+347
	z	+90

- 11 Connection to cab heater (M18x1.5)
(remove lid to access)

11	x	-1229
	y	+108
	z	+396

- 12 Customer interface EMS

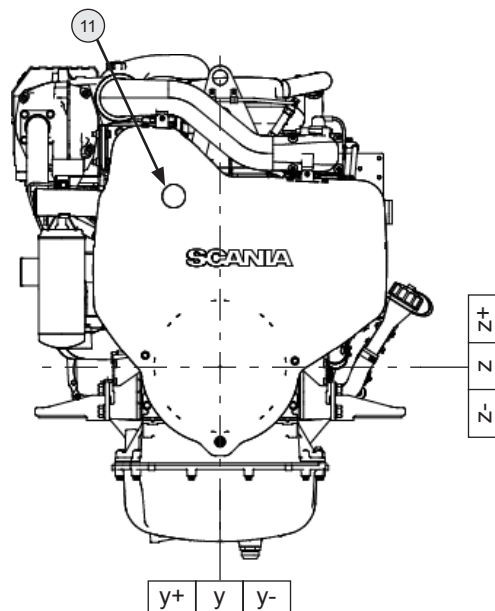
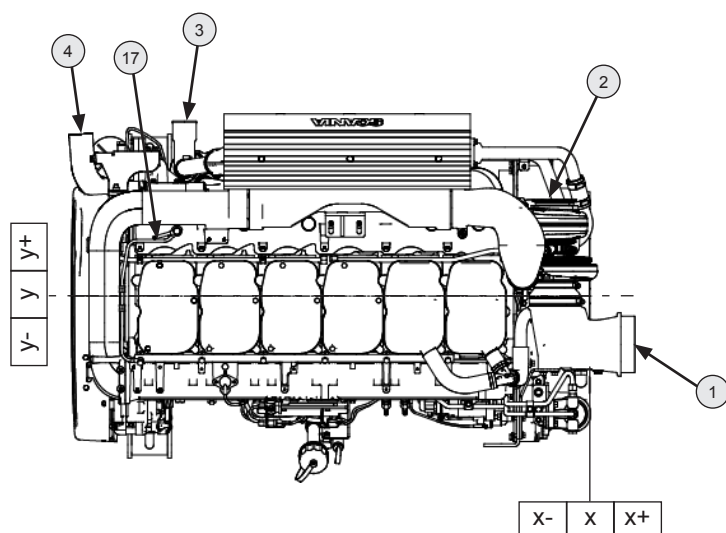
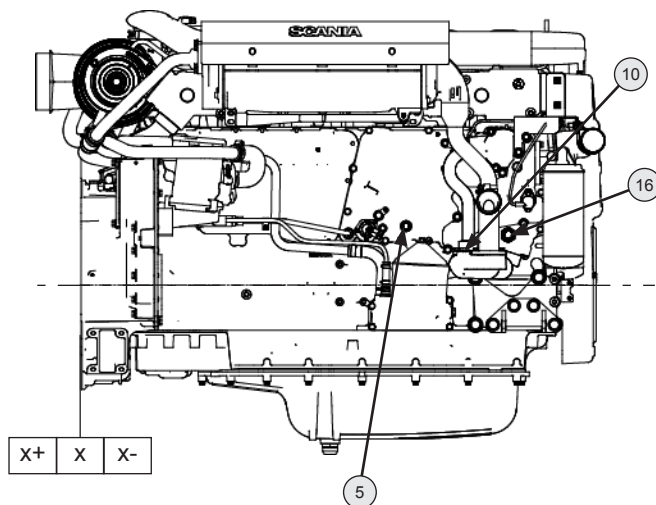
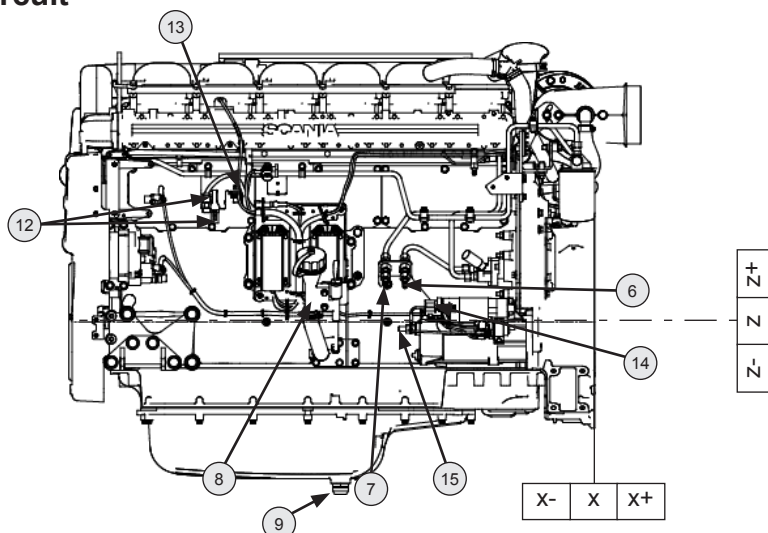
- 13 Diagnostic socket

- 14 Battery connection + (M10)

- 15 Battery connection - (M12)

- 16 Static line (Ø 25 mm)

- 17 Coolant bleed pipe (Ø 8 mm)



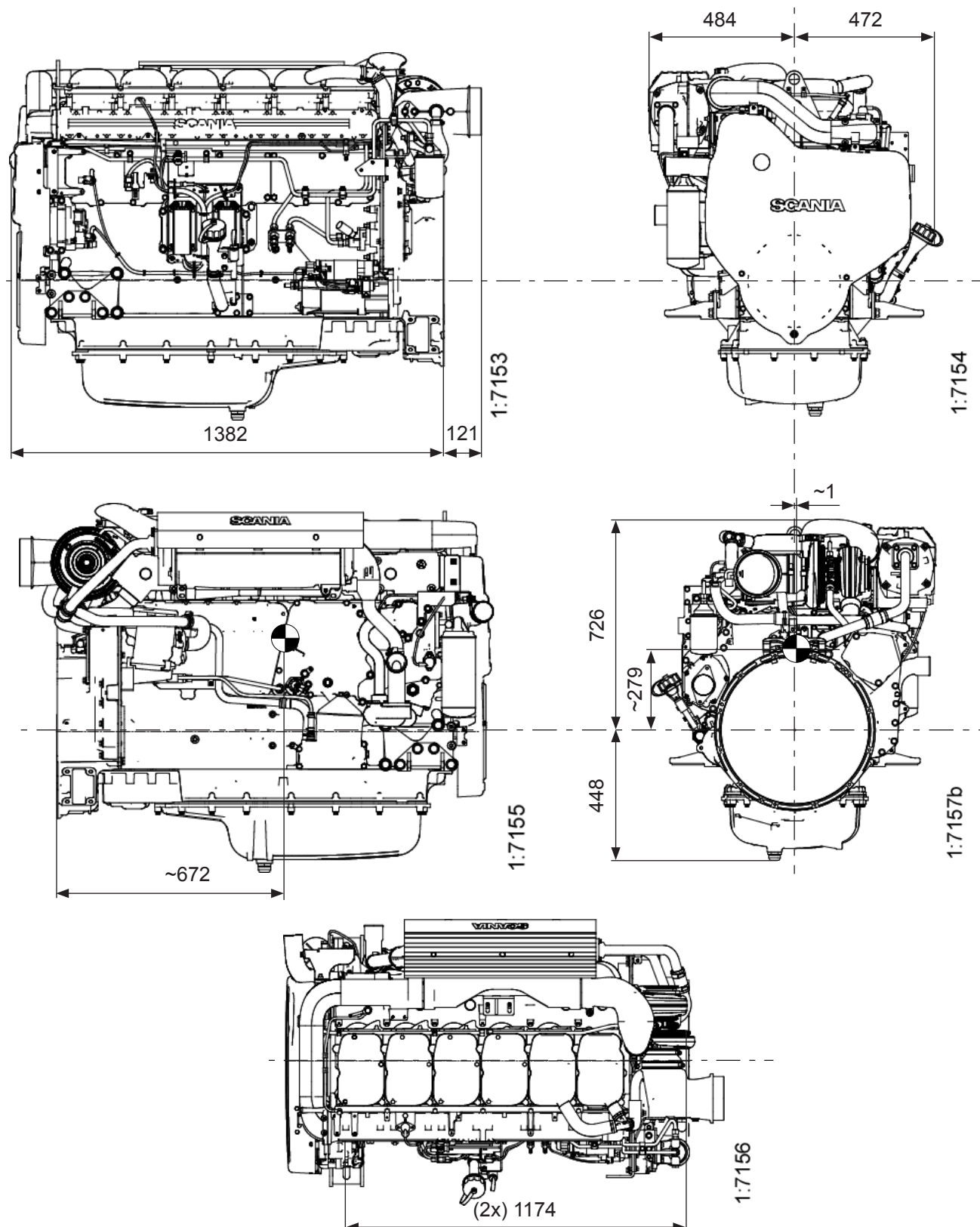


Dimensional drawings

All sketches are only intended as general sales information and must not be used for any installation purposes. The values for centre of gravity applies for engines with standard equipment including coolant. All dimensions are indicated in mm.

DI13 071/073M - With keel cooling, single circuit

Drawing no 1 866 384

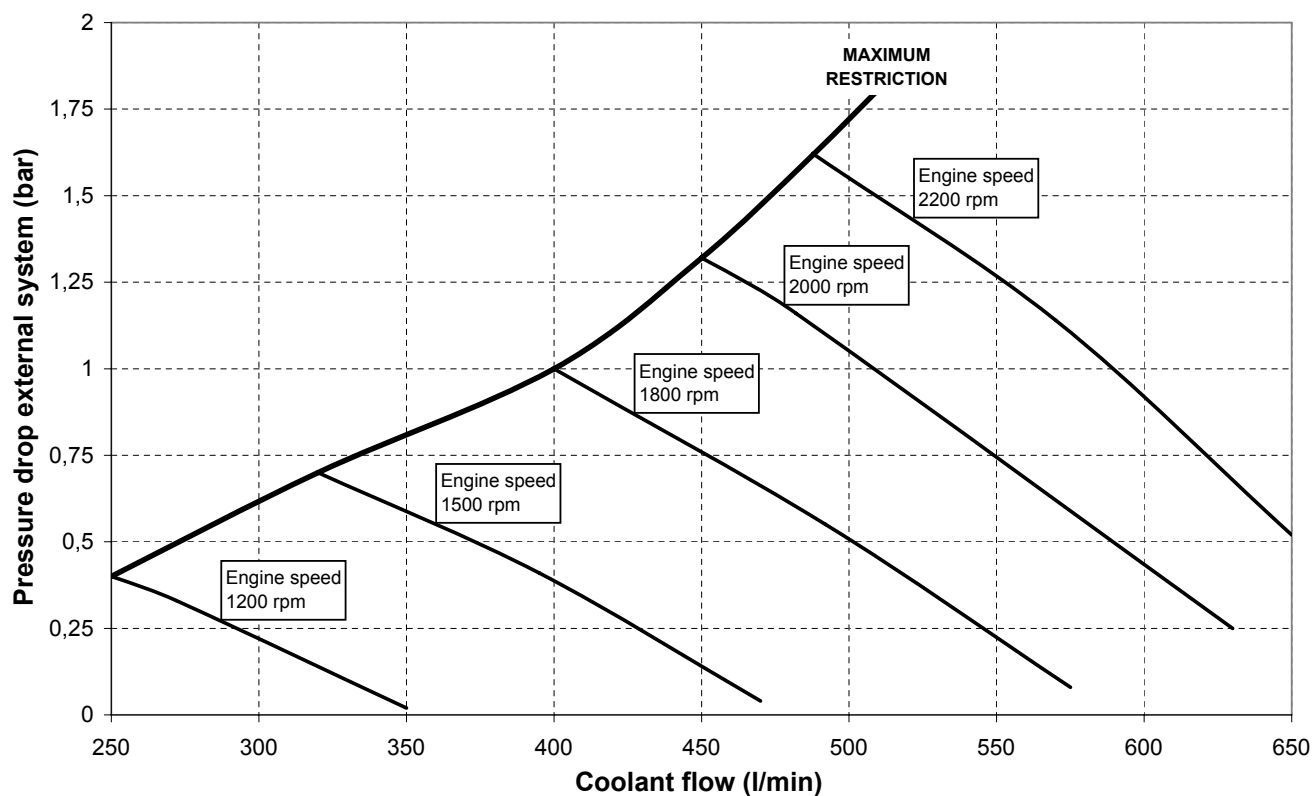


5_A



Coolant flow

The coolant flow depends on the pressure drop in the external system according to the graph below.
Valid for all DI13.





Equipment list

S = Standard

O = Optional

For illustrations and technical data, please see 'Equipment data'.

Drawings referred to in this section are available on Scania's Technical Information Library, TIL, under 'Drawings industrial & marine engines' or can be ordered via Pre-sales FRAS.

Ref	Description	Requirements	Remark	Drw No
10K	TORSIONAL VIBRATION CALCULATIONS			
-00	S Without			
-01	O Single engine installation with 1-3 driven masses. Typical genset or direct driven propeller installations.		Note! TVC can not be ordered directly.	
-02	O Several driven masses both behind and/or in front of the engine. Genset with auxiliary devices, propeller installations with front PTO, propeller installations with marine transmissions.		Torsional vibration calculations must be requested with the TVC form available at https://sail.scania.com and sent to factory for evaluation, before an actual order can be placed.	
-03	O Branched drive train, multi engine (advanced) installations, belt driven units etc.		If a TVC calculation has been rejected, further investigation is possible and will be charged per hour.	

10M CLASSIFICATION

Note! For information about approved engines, access SAIL at <http://sail.scania.com>.

-00	S Without	
-01	O ABS: American Bureau of Shipping	Req. 65-03
-02	O BV: Bureau Veritas	Req. 65-02 or -03
-03	O DNV: Det Norske Veritas	Req. 65-02 or -03
-04	O GL: Germanischer Lloyd	Req. 65-02 or -03
-05	O LR: Lloyds Register	Req. 65-03
-06	O RINA: Registro Italiano Navale	Req. 65-03
-11	O SF: Sjöfartsverket	
-12	O RS: Russian Maritime Register of Shipping	Req. 65-02 or -03
-13	O RRR: Russian River Register	
-14	O CCS: China Classification Society	Req. 65-02 or -03
-15	O TL: Türk Loydu	Req. 65-03
-16	O CRS: Croatian Register of Shipping	Req. 65-02 or -03



Ref	Description	Requirements	Remark	Drw No
100	TYPE OF IMO CERTIFICATE			
	<i>Note! Ships in Russia: All engines above 130 kW on vessels with flag state Russia, except emergency engines, must have EIAPP certificate issued by Russian Maritime Register of Shipping, 10O-05.</i>			
	<i>Note! Ships in China: All engines above 130 kW on vessels with flag state China, except emergency engines, must have EIAPP certificate issued by China Classification Society, 10O-06.</i>			
	<i>Note! EIAPP for German-flagged vessels will have an additional fee due to extra costs caused by the German Administration.</i>			
-00	S Without			
-01	O EIAPP certificate issued by Germanischer Lloyd - GL			
-02	O S.o.C certificate issued by Germanischer Lloyd - GL			
-05	O EIAPP certificate issued by Russian Maritime Register of Shipping - RS	Req. 10M-12	No EIAPP certificate will be issued if the engine is not classified by RS.	
-06	O EIAPP certificate issued by China Classification Society - CCS	Req. 10M-14	No EIAPP certificate will be issued if the engine is not classified by CCS.	
25A	CONNECTION EMS			
<i>The connector kit contains pins and connector for connecting to the electrical interface on the engine. The customer will attach the wirings to the connectors himself.</i>				
-00	O Without	Req. 26C-01 or 27C-01/02		
-01	S With connector kit	Req. 26C-00 and 27C-00		
-02	O With cable 6.3 m incl. connector	Req. 26C-00 and 27C-00		
25B	OIL TEMP, Integrated oil temp. sensor			
-00	S Without			
-01	O With			
25C	COOLANT LEVEL MONITOR			
<i>The coolant level monitor is used to ensure that the coolant level is not dropping below a critical level that leaves the temperature sensor in the air. If the temperature sensor is not in contact with the coolant, boiling will not be detected, causing a risk for engine damages. The coolant level monitor is strongly recommended since the engine room is mostly remote operated.</i>				
-00	S Without		Note! Requires a level monitor from an	
-01	O Level monitor 2-pole, normally closed (when mounted in application)	Req. 28F-01, -02, -03 or -04	external manufacturer.	
25D	STARTER			
-00	O Without			
-01	S 2-pole, 7 kW, EMS controlled			1 882 043
25E	ALTERNATOR			
<i>In the selection of an alternator the total electrical consumption must be considered. It is essential that a reserve of electrical power is available in order to avoid voltage drop in the EMS and problems with equipment such as instrumentation and lighting.</i>				
-00	O Without			
-01	S 2-pole, 100A, EMS controlled			1 743 548
-04	O 2-pole, 2 x 100A, EMS controlled			1 743 548



Ref	Description	Requirements	Remark	Drw No
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25F ENGINE HEATER

The engine heater will ensure that the engine keeps a temperature level above the ambient for easier starting. Since a warm engine have less friction, emission and operates more smoothly due to warm oil it will be more environmental friendly and significantly reduce engine wear. Engine heater 1500W with thermostat is recommended for customers that will use the heater continuously. Engine heater 500W is recommended for installations with insufficient fusing for using 1500W.

-00	S	Without		
-01	O	1500 W/230 V, plug in type	Only for engines with keel cooling	1 722 729
-06	O	1500 W/115 V, plug in with thermostat		2 074 315
-07	O	1500 W/230 V, plug in with thermostat		2 074 315
-08	O	550 W/230 V, plug in with thermostat		2 074 315
-09	O	550 W/115 V, plug in with thermostat		2 074 315

25G POWER CABLE BETWEEN ALTERNATOR AND STARTER

The power cable is the feeding cable from the alternator to the starter motor for charging the batteries. The cable is mandatory to have either supplied by Scania or by the customer. The alternator requires constant 24V connected at B+ in order to work correctly.

-00A	O	Without		
-01A	S	With, for single alternator configuration	Req. 25E-01	Note! The power cable is non-fused and not approved for classification.
-02	O	With, for double alternator configuration	Req. 25E-04	

5A

25H OIL LEVEL SENSOR

The oil level sensor enables the engine operator to electronically read the level of oil in the engine as a part of the daily inspection. It is a complement to oil dipstick. The signal must be taken care of by the customer directly from the sensor.

-00	S	Without		
-02	O	With, but without electrical connection (connected and monitored by customer)		1 891 846

SCANIA INSTRUMENTATION

26C BASE SYSTEM

-00	S	Without		
-01	O	With	Req. 10M-00, -13 or -16; 25G-01, -02; 26E-01, -02, -03, -04; 28O-04	2 181 152

26D ACCELERATOR POSITION SENSOR

-00	S	Without	Prepared for non-Scania throttle when Base system is ordered.	
-01	O	Sensor with cable 2m	Req. 10M-00, -13 or -16; 26C-01	1 364 185
-02	O	Sensor with cable 8m	Req. 10M-00, -13 or -16; 26C-01	1 364 185



Ref	Description	Requirements	Remark	Drw No
26E	CABLE LENGTH BETWEEN MSB AND CBC			
-00	S Without	Req. 26C-00		
-01	O Cable length 2m	Req. 10M-00, -13 or -16; 26C-01		
-02	O Cable length 8m	Req. 10M-00, -13 or -16; 26C-01		
-03	O Cable length 12m	Req. 10M-00, -13 or -16; 26C-01		
-04	O Cable length 24m	Req. 10M-00, -13 or -16; 26C-01		
26F	CONTROL PANEL			
-00	S Without			
-03	O With, one panel	Req. 10M-00, -13 or -16; 26C-01		2 014 191
-04	O With, one panel with cover	Req. 10M-00, -13 or -16; 26C-01		2 014 191
26G	INSTRUMENT PANEL			
-00	S Without			
-01	O With, 2-pole	Req. 10M-00, -13 or -16; 26C-01		2 013 194
-02	O With cover, 2-pole	Req. 10M-00, -13 or -16; 26C-01		2 013 194
26H	SCANIA EMS DISPLAY			
<i>The EMS display is used to read out data, for example fuel consumption and configure specific parameters in the Engine Management System, for example alarm levels. The information is presented in an LCD display. It is also possible to read fault codes via the EMS display.</i>				
-00	S Without			
-01	O Instrument panel, 2-pole. Including cable harness to CBC, 3m	Req. 10M-00, -13 or -16; 26C-01		1 761 984
26J	REMOTE CONTROL BOX			
<i>The remote control box contains a switch for 'remote'/'local' operation, in 'local' mode the engine can't be remotely started. This is a safety feature.</i>				
-00	S Without			
-01	O With cable, length 4m	Req. 10M-00, -13 or -16; 26C-01		1 902 912



Ref	Description	Requirements	Remark	Drw No
SCANIA INSTRUMENTATION 2.0				
Scania Instrumentation 2.0 is an electrical system with two levels - without or with type approval. All 2.0 options have a family code that starts with 27. Note! Options that have codes that start with 27 are <u>not</u> possible to combine with options that have codes that starts with 26.				
27C BASE SYSTEM 2.0				
Includes: • Main Supply Box, MSB: fuses, diodes and relays • Main Control Display, MCD: coordinator and 5.7" colour touch screen (to view engine data and control the engine). Must be located in engine room when type approved. • 3 or 6 m cable to engine Cable between MSB and MCD is ordered separately (ref.code 27E).				
-00	S Without			
-01	O With 3 m cable	Req. 10M-00 or 27M-01 Req. 26C-00		2 135 526
-02	O With 6 m cable	Req. 10M-00 or 27M-01 Req. 26C-00		2 135 526
27D ACCELERATOR POSITION SENSOR				
-00	S Without			
-01	O With	Not with 27C-00 Req. 28O-04 or -05	Only compatible with redundant throttle on the ECU	1 364 185
27E CABLE LENGTH BETWEEN MSB AND MCD				
-00	S Without	Req. 27C-00		
-01	O Cable length 3 m	Req. 27C-01 or -02		2 135 526
-02	O Cable length 6 m	Req. 27C-01 or -02		2 135 526
-04	O Cable length 12 m	Req. 27C-01 or -02	Cable length 12, 26 and 46 m is only available if not type approved/not with 27M-01.	2 135 526
-08	O Cable length 26 m	Req. 27C-01 or -02		2 135 526
-10	O Cable length 46 m	Req. 27C-01 or -02		2 135 526
27F CONTROL PANEL				
Includes start key, engine speed switches and 2 m cable. Can be connected to the Main Control Display (MCD) or to an Extra Control Display (ECD).				
-00	S Without			
-01	O 1 set incl. 2 m cable	Req. 27C-01 or -02		2 095 987
-02	O 1 set incl. 2 m cable with cover	Req. 27C-01 or -02		2 095 987
-03	O 2 sets incl. 2 m cable	Req. 27C-01 or -02 Not with 27G-00		2 095 987
-04	O 2 sets incl. 2 m cable with cover	Req. 27C-01 or -02 Not with 27G-00		2 095 987
-05	O 3 sets incl. 2 m cable	Req. 27C-01 or -02 Not with 27G-00 or -01		2 095 987
-06	O 3 sets incl. 2 m cable with cover	Req. 27C-01 or -02 Not with 27G-00 or -01		2 095 987



Ref	Description	Requirements	Remark	Drw No
27G	EXTRA CONTROL DISPLAY (ECD)			
	<i>5.7" colour touch screen. Connected to the Main Control Display (MCD) by an Ethernet cable. Cables to MCD and ECD-switch are ordered separately (ref. codes 27H/J/K/L).</i>			
-00	S Without	Req. 27H-00, 27J-00, 27K-00 and 27L-00		
-01	O 1 display	Req. 27C-01 or -02, 27H-00, 27K-00 and 27L-00 Not with 27J-00		2 077 118
-02	O 2 displays	Req. 27C-01 or -02 and 27L-00 Not with 27H-00, 27J-00 or 27K-00	Including switch (connected between MCD and ECD)	2 077 118
-03	O 3 displays	Req. 27C-01 or -02 Not with 27H-00, 27J-00, 27K-00 or 27L-00	Including switch (connected between MCD and ECD)	2 077 118
27H	CABLE LENGTH BETWEEN MCD AND ECD-SWITCH			
-00	S Without			
-01	O 10 m			2 135 526
-02	O 20 m			2 135 526
-03	O 50 m			2 135 526
27J	CABLE LENGTH TO EXTRA CONTROL DISPLAY (ECD) 1			
-00	S Without			
-01	O 10 m			2 135 526
-02	O 20 m			2 135 526
-03	O 50 m			2 135 526
27K	CABLE LENGTH TO EXTRA CONTROL DISPLAY (ECD) 2			
-00	S Without			
-01	O 10 m			2 135 526
-02	O 20 m			2 135 526
-03	O 50 m			2 135 526
27L	CABLE LENGTH TO EXTRA CONTROL DISPLAY (ECD) 3			
-00	S Without			
-01	O 10 m			2 135 526
-02	O 20 m			2 135 526
-03	O 50 m			2 135 526
27M	TYPE APPROVED INSTRUMENTATION			
	<i>Includes Safety Device Unit (SDU), which must be located in engine room, and sensors for oil, water and fuel pressure, water temperature and engine speed. The SDU and sensors are configured with an engine shutdown function. Cables to MSB and engine are ordered separately (ref. codes 27N/P).</i>			
-00	S Without	Req. 27N-00 and 27P-00		
-01	O With	Req. 27C-01 or -02 Req. 27E-01 or -02 Not with 27N-00 or 27P-00	<u>Note!</u> Type approved by DNV. Only approved for multiple installations.	2 135 526
27N	CABLE LENGTH BETWEEN MSB AND SDU			
-00	S Without			
-01	O 3 m		<u>Note!</u> Type approved by DNV.	2 135 526
-02	O 6 m		<u>Note!</u> Type approved by DNV.	2 135 526



Ref	Description	Requirements	Remark	Drw No
27P CABLE LENGTH BETWEEN ENGINE AND SDU				
-00	S Without			
-01	O 3 m		Note! Type approved by DNV.	2 135 526
-02	O 6 m		Note! Type approved by DNV.	2 135 526
EMS PARAMETER SETTINGS				
28A REGULATOR TYPE (EMS parameter setting)				
-01	S RQV Governor (default value)		Note! The accelerator position sensor controls the engine with possible droop. Common for most applications.	
-02	O RQ Governor	Req 28G-00	Note! The accelerator position sensor controls the engine torque/power.	
28B ENGINE TEMP. REACTION (EMS parameter setting)				
<i>High engine temp reaction, 28B-03 to -06, is recommended in applications where the engine is remotely operated</i>				
-01	S Only alarm (default value)		Note!	
-02	O Torque reduction on low limit		• For a classified engine: see applicable classification rules for the intended application.	
-03	O Engine stop on high limit		• Alarm is always included regardless of option.	
-04	O Engine stop on high limit and torque reduction on low limit		• Override possibility refer to engine stop only, not torque reduction	
-05	O Engine stop on high limit (with override possibility)			
-06	O Engine stop on high limit (with override possibility) and torque reduction on low limit			
28C TEMP. LIMIT HIGH (EMS parameter setting)				
<i>This temp. limit decides the engine temp HIGH alarm limit that are described in 28B-.</i>				
-01	O 98°C			
-02	O 100°C			
-03	O 102°C			
-04	O 103°C			
-05	O 104°C			
-06	S 105°C (default value)			
28D TEMP. LIMIT LOW (EMS parameter setting)				
<i>This temp. limit decides the engine temp LOW alarm limit that are described in 28B-.</i>				
-01	S 95°C (default value)			
-02	O 98°C			
-03	O 100°C	Not with 28C-01		
-04	O 103°C	Not with 28C-01, -02 or -03		
28E LOW OIL PRESSURE REACTION (EMS parameter setting)				
<i>Low oil pressure reaction -03 or -04 is recommended in applications where the engine is remotely operated.</i>				
-01	S Only alarm (default value)		Note! For a classified engine: see applicable classification rules for the intended application.	
-02	O Torque reduction, ~30%			
-03	O Engine stop			
-04	O Engine stop with override			



Ref	Description	Requirements	Remark	Drw No
28F	LOW COOLANT LEVEL REACTION (EMS parameter setting)			
Low coolant level reaction -03 or -04 is recommended in applications where the engine is remotely operated. The option is only valid for engines with coolant level sensor, option 25C.				
-00	S Without	Req. 25C-00	Note! For a classified engine: see applicable classification rules for the intended application.	
-01	O Only alarm (default value if 25C-01)	Req. 25C-01		
-02	O Torque reduction, ~30%	Req. 25C-01		
-03	O Engine stop	Req. 25C-01		
-04	O Engine stop with override	Req. 25C-01		
28G	DROOP SETTING (EMS parameter setting)			
Standard setting is recommended for propulsion application, for auxiliary engines powering for example hydraulic pumps the stiff droop is recommended.				
-00	O Without	Req. 28A-02	Note! Speed droop is a concept that describes the change in speed that takes place when loading the engine or when the load is removed.	
-02	S Stiff			
28L	LIMITED HIGH IDLE WHEN COLD ENGINE (EMS parameter setting)			
This function limits the engine speed when the engine is cold, it takes approx 30 seconds before the engine can be revved more than 1000rpm.				
-00	S Without (default value)			
-01	O With			
28M	HIGH IDLE SPEED OFFSET (EMS parameter setting)			
-01	O 4%		Note! Max engine speed is not allowed to exceed 2450 rpm	
-02	O 6%			
-03	O 8%		Example: Engine factory rating + High idle speed offset = Max engine speed 1800 rpm + 16% = 1800 + 288 = 2088 rpm	
-04	S 10% (default value)	Not for engine speed 2300 rpm		
-05	O 12%	Not for engine speed 2300 rpm		
-06	O 14%	Not for engine speed 2300 rpm		
-07	O 16%	Not for engine speed 2300 rpm		
28N	LOW IDLE SPEED (EMS parameter setting)			
The low idle speed is set at such a level that resonance frequencies (critical speeds) in the powertrain are avoided.				
-01	O 500 rpm			
-02	O 550 rpm			
-03	O 600 rpm			
-04	S 650 rpm (default value)			
-05	O 700 rpm			
-06	O 750 rpm			
-07	O 800 rpm			
-08	O 850 rpm			
-09	O 900 rpm			
-10	O 950 rpm			
-11	O 1000 rpm			
-12	O 1050 rpm			



Ref	Description	Requirements	Remark	Drw No
28O	LIMP HOME (EMS parameter setting)			
<i>Important to consider: Is there a risk for injuries of personnel or damages to equipment if the engine runs out of control?</i>				
-01	O Low idle		Settings for how the engine should operate permanently or react due to defect acc. pedal signal or interrupted CAN communication.	
-02	S Incremented low idle ~800 rpm (default value)			
-03	O Shut-off due to CAN defect			
-04	O Redundant throttle (limp home)		Note! Ref. 28O-04/05 are intended for customers who wish to connect their own redundant/analogue throttle control directly to the EMS or to engine interface C4002.	
-05	O Redundant throttle always active			
28S	HIGH CHARGE TEMP REACTION			
<i>High charge temp reaction 28S-03 to -06 is recommended in applications where the engine is remotely operated.</i>				
-01	S Only alarm		Note! • For a classified engine: see applicable classification rules for the intended application. • Alarm is always included regardless of option. • Override possibility refer to engine stop only, not torque reduction	
-02	O Torque reduction on low limit			
-03	O Engine stop on high limit			
-04	O Engine stop on high limit and torque reduction on low limit			
-05	O Engine stop on high limit (with override possibility)			
-06	O Engine stop on high limit (with override possibility) and torque reduction on low limit			
45	FLYWHEEL			
-01	S SAE 14			1 925 825
46	FLYWHEEL HOUSING			
-01	S SAE1 flange			1 925 826



Ref	Description	Requirements	Remark	Drw No
49	ENGINE BRACKET			
<i>Main factors to consider when selecting engine suspension are installation height of the engine and forces applied to the engine and driven equipment due to operating conditions. For further information please see the Installation manual.</i> <i>All engine suspensions are available with:</i> - Front-mounted brackets - Front- and rear-mounted brackets or - Front-mounted brackets and prepared for rear-mounted brackets, which means that the surface on the flywheel housing intended for rear-mounted brackets is unpainted.				
-01 S	Fixed low 120 mm below the crankshaft		Front-mounted brackets	1 866 025
-01Z O	Fixed low 120 mm below the crankshaft		Front-mounted brackets. Prepared for rear-mounted brackets.	1 866 025
-02A O	Fixed low 120 mm below the crankshaft		Front- and rear-mounted bracket	1 866 025
-03 O	Power pack type 230 mm below the crankshaft		Front-mounted brackets	1 858 891
-03Z O	Power pack type 230 mm below the crankshaft		Front-mounted brackets. Prepared for rear-mounted brackets.	1 858 891
-04 O	Power pack type 230 mm below the crankshaft		Front- and rear-mounted brackets	1 858 891
-09 O	Fixed extra low 25 mm above the crankshaft		Front-mounted brackets	1 866 025
-09Z O	Fixed extra low 25 mm above the crankshaft		Front-mounted brackets. Prepared for rear-mounted brackets.	1 866 025
-10 O	Fixed extra low 25 mm above the crankshaft		Front- and rear-mounted bracket	1 866 025
49A	ENGINE SUSPENSION			
-00 S	Without			
-01 O	Stiff rubber suspension	Not with 49-02A, -04 or -10	Front	1 866 025
-02 O	Stiff rubber suspension	Req. 49-02A, -04 or -10	Front and rear	1 866 025
51	AIR CLEANER			
<i>The selection of air cleaner is dependent on the concentration of dust in the air that surrounds the engine.</i> <i>Light duty is suitable for applications working in low dust environment, ocean going. Medium duty is suitable for applications in dusty environments like river boats where dust from land easily can be carried to the vessel.</i>				
-01A S	Prepared			
-05 O	Light duty, Ø15".		Separately. Without hose.	1 925 175
-08 O	Medium duty, Ø15" incl. safety element and pre-cleaner.		Separately. Without hose.	1 925 176
-10 O	Light duty, Ø8"		Mounted on turbo charger	1 529 410
56	EXHAUST BEND			
-01 S	Without, but with turbo-mounted flange	Req. 57-00		1 866 302
-02 O	90° bend, adjustable direction	Req. 57-02, -03, -05 or -06		1 866 302
-06 O	Water cooled, 90° bend, pointing rearwards	Req. 57-00	Note! Only for engines with heat exchanger	1 866 201



Ref	Description	Requirements	Remark	Drw No
57	EXHAUST FITTINGS			
-00	S Without			
-02	O Flange, Ø130 mm			1 866 302
-03	O Flange, Ø155 mm			1 866 302
-05	O Compensator and flange, Ø130 mm			1 866 302
-06	O Compensator and flange, Ø155 mm			1 866 302
60	OIL SUMP			
-01A	S Deep front oil sump			1 927 084
-03B	O Low oil sump			1 866 386
-04A	O Extra low oil sump	Not with 25H-02		2 122 395
60A	OIL DIPSTICK			
-01	S Short, left hand side, in block			2 060 862
-02	O Long, left hand side, rear in block	Req. 61-05B		1 866 386
60B	ENGINE OIL, FACTORY FILLED			
<i>The engine can be delivered with factory filled engine oil. This option is suitable for customers that are interested in reducing or eliminating the handling of oil in their production process.</i> <i>Engine oil: Scania LDF-3. Viscosity class: 10W-40. Outside temperature: -20°C - >+30°C.</i>				
-00	S Without			
-02	O For deep front oil sump	Req. 60-01A		
-04	O For low oil sump	Req. 60-03B		
-05	O For extra low oil sump	Req. 60-04A		
61	OIL FILLER			
-01A	S In engine block, left hand side	Req. 60A-01		2 060 862
-01B	O In valve cover, cyl 1, and engine block, left hand side	Req. 60A-01		2 060 862
-05B	O In valve cover, cyl 1, and engine block, rear left hand side	Req. 60A-02		1 866 386
62	OIL DRAINING			
<i>The selection of oil draining is dependent on the installation. Especially critical is the space available below and next to the oil drain plug. If space for a drain bucket is available, then the standard oil plug is preferred as a simple solution. The hand pump, or electrical pump, is used if the oil is drained to a level above the engine.</i>				
-01	S With plug			
-03	O With hand pump, right hand side		Delivered loose	1 859 139
-04	O With hand pump, left hand side		Delivered loose	1 859 139
-05	O With electric pump and 3-way cock on right hand side		Delivered loose	1 407 848
-06	O With electric pump and 3-way cock on left hand side		Delivered loose	1 407 848
65	CRANKSHAFT			
<i>The crankshaft is a part subject to special requirements regarding traceability by the class societies. For approval by specific class societies this might be a requirement, to be checked with the class society.</i>				
-01	S Not classified			
-02	O With 3.1 material certificate			
-03	O Classified by Lloyds Register			



Ref	Description	Requirements	Remark	Drw No
78	SEA WATER PUMP			
<i>The self-priming centrifugal seawater pump is suitable for operations in water containing large amounts of sand, mud or solids. The self-priming pump can withstand to be run without water for a short period. Typical operations are river boats in muddy water and rescue boats that may have to enter the shore during operation.</i>				
-00	S Without		Note! Only for engines with keel cooling	
-01	S With		Note! Only for engines with heat exchanger	
-02	O With connection hoses		Note! Only for engines with heat exchanger	1 866 201
-03	O With connection tubes		Note! Only for engines with heat exchanger	1 866 201
-11	O Self-priming centrifugal pump	Req. 78B-01	Note! Only for engines with heat exchanger	1 866 201
-12	O Self-priming centrifugal pump with hose connection	Req. 78B-01	Note! Only for engines with heat exchanger	
-13	O Self-priming centrifugal pump with tube connection	Req. 78B-01	Note! Only for engines with heat exchanger	
78A	BILGE PUMP			
-00	S Without			
-01	O With one bilge pump	Req. 90-00 Not with 49-03,-03Z or -04		1 866 350
-02	O With two bilge pumps	Req. 90-00 Not with 49-03,-03Z or -04	For example to be used as one bilge pump and one flush pump.	1 866 350
78B	SEA WATER PUMP POSITION			
<i>For SAE B rear high position there is a risk for interference with large transmission housings or generators. In order to avoid interference in these cases SAE B low rear pointing forward is recommended.</i>				
-00	S Without		Note! Only for engines with keel cooling	
-01	S SAE B high rear		Note! Only for engines with heat exchanger	1 866 201
-02	O SAE B low rear pointing forward	Req. 96A-00	Note! Only for engines with heat exchanger	1 866 201
90	FRONT-MOUNTED POWER TAKE-OFF (PTO)			
<i>A front-mounted PTO is suitable for applications that need high torques, for example large auxiliary pumps and air compressors. Normally the driven equipment is mounted separate from the engine.</i>				
-00	S Without			
-02	O Crankshaft pulley with two extra grooves, Ø260 mm	Req. 78A-00		1 866 359
-04	O Crankshaft pulley with three extra grooves, Ø260 mm	Req. 78A-00		1 866 359
-05	O Stub shaft for connection of flexible coupling. Max torque 1200 Nm	Req. 78A-00		1 866 359
-06	O Stub shaft for connection of flexible coupling with crankshaft pulley with three extra grooves, Ø260 mm. Max torque 1200 Nm.	Req. 78A-00		1 866 359



Ref	Description	Requirements	Remark	Drw No
91	SIDE-MOUNTED POWER TAKE-OFF (PTO)			
<i>A side-mounted PTO is used for low rated engine-mounted hydraulic pumps or compressors.</i>				
-00	S Without			
-01	O Prepared for SAE B	Req. 78B-00 or -02		
-02	O SAE B, 2-hole, 13 teeth. Gear ratio 1:1.19. Pointing backwards.	Req. 78B-00 or -02	Note! Max torque 250 Nm (continuous) Max torque 400 Nm (intermittent)	1 448 964
-03	O SAE A, 2-hole, 9 teeth. Gear ratio 1:1.71. Pointing backwards.	Req. 93-00	Note! Max torque 100 Nm (continuous) Max torque 125 Nm (intermittent)	1 798 247
-04	O SAE A and SAE B	Req. 78B-00 or -02 Req. 93-00		
-05	O SAE B, 2-hole, 13 teeth. Gear ratio 1:1.19. Low, pointing forward.	Req. 78B-00 or -01		1 945 647
-08	O SAE A and SAE B low, pointing forward	Req. 78B-00 or -01 Req. 93-00		
92A	AC COMPRESSOR			
-00	S Without			
-01	O With	Req. 25E-01		
93	HYDRAULIC PUMP			
-00	S Without			
-01	O Capacity 16 l/min at 170 bar intermittent, 25-30 bar continuous		Note! Without pressure reduction valve	1 757 131 1 449 167
-02	O Capacity 25 l/min at 170 bar intermittent, 25-30 bar continuous		Note! Without pressure reduction valve	1 757 131 1 449 167
96A	MARINE TRANSMISSION CONNECTION PARTS			
<i>This option includes water pipe between engine and transmission oil cooler.</i>				
<i>This option requires Marine Transmission from factory (S-order).</i>				
-00	S Without			
-01	O Mounting parts for MG-5095 A	Req. 96C-01	Note! Only for engines with heat exchanger	
-02	O Mounting parts for MGX-5095 A	Req. 96C-01	Note! Only for engines with heat exchanger	
-03	O Mounting parts for MG-5095 SC	Req. 96C-01	Note! Only for engines with heat exchanger	
-04	O Mounting parts for MGX-5095 SC	Req. 96C-01	Note! Only for engines with heat exchanger	
-05	O Mounting parts for MG-5114 A	Req. 96C-01	Note! Only for engines with heat exchanger	
-06	O Mounting parts for MGX-5114 A	Req. 96C-01	Note! Only for engines with heat exchanger	
-07	O Mounting parts for MG-5114 SC	Req. 96C-01	Note! Only for engines with heat exchanger	
-08	O Mounting parts for MGX-5114 SC	Req. 96C-01	Note! Only for engines with heat exchanger	
-09	O Mounting parts for MG-5135 A	Req. 96C-01	Note! Only for engines with heat exchanger	
-10	O Mounting parts for MGX-5135 A	Req. 96C-01	Note! Only for engines with heat exchanger	
-11	O Mounting parts for MG-5135 SC	Req. 96C-01	Note! Only for engines with heat exchanger	
-12	O Mounting parts for MGX-5135 SC	Req. 96C-01	Note! Only for engines with heat exchanger	
-13	O Mounting parts for ZF 360	Req. 96C-01	Note! Only for engines with heat exchanger	
-14	O Mounting parts for ZF 360 A	Req. 96C-01	Note! Only for engines with heat exchanger	



Ref	Description	Requirements	Remark	Drw No
96B	MARINE TRANSMISSION SUSPENSION			
This option requires Marine Transmission from factory (S-order).				
-00	S Without			
-01	O Fixed suspension for MG/MGX-5095 A / SC	Req. 49-01, -01Z or -02A	Note! Only for engines with heat exchanger	
-02	O Stiff rubber suspension for MG/MGX-5095 A / SC	Req. 49-01, -01Z or -02A Req. 49A-01 or -02	Note! Only for engines with heat exchanger	
-03	O Fixed suspension for MG/MGX-5114 A	Req. 49-01, -01Z or -02A	Note! Only for engines with heat exchanger	
-04	O Stiff rubber suspension for MG/MGX-5114 A	Req. 49-01, -01Z or -02A Req. 49A-01 or -02	Note! Only for engines with heat exchanger	
-05	O Fixed suspension for MG/MGX-5114 SC	Req. 49-01, -01Z or -02A	Note! Only for engines with heat exchanger	
-06	O Stiff rubber suspension for MG/MGX-5114 SC	Req. 49-01, -01Z or -02A Req. 49A-01 or -02	Note! Only for engines with heat exchanger	
-07	O Fixed suspension for MG/MGX-5135 A / SC	Req. 49-01, -01Z or -02A	Note! Only for engines with heat exchanger	
-08	O Stiff rubber suspension for MG/MGX-5135 A / SC	Req. 49-01, -01Z or -02A Req. 49A-01 or -02	Note! Only for engines with heat exchanger	
-09	O Fixed suspension for ZF 360 / 360 A	Req. 49-01, -01Z or -02A	Note! Only for engines with heat exchanger	
-10	O Stiff rubber suspension for ZF 360 / 360 A	Req. 49-01, -01Z or -02A Req. 49A-01 or -02	Note! Only for engines with heat exchanger	
96C	STUDS IN FLYWHEEL HOUSING			
-00	S Without			
-01	O With			
98C	FUEL PRE-FILTER			
Fuel pre-filter is required for all Scania marine engines. Water will condensate in the tank and enter the fuel, thus a risk of engine disturbances. The fuel pre-filter separates water from the fuel. The option without is valid for customers who uses a non-Scania pre-filter.				
-00	O Without		Note! 98C-00 requires a water separating pre-filter from an external manufacturer. If no filter is mounted the engine warranty is not valid.	
-01	S Single fuel filter with water separator	Req. 10M-00	Note! Not type approved by any classification society.	1 774 501
-03	O Reversible dual fuel filter with water separator		Note! Type approved by ABS and BV.	1 769 500
98D	CAB HEATER			
-00	S Without			
-01	O Prepared for cab heater connection front			
-02	O Prepared for cab heater connection rear		Note! Only for engines with heat exchanger	
99G	PAINTWORK			
-01	S Orange heavy duty quality / silver on warm parts			
99L	CRANKCASE VENTILATION			
-01	S Closed ventilation			1 866 026



Ref	Description	Requirements	Remark	Drw No
99P	OPERATOR'S MANUAL			
-00	O Without		Note! If a preferred language is not specified when ordering, the operator's manual will be delivered in English. Available languages are: Chinese (simplified), Chinese (trad.), Czech, Danish, Dutch, English, Finnish, French, German, Italian, Japanese, Korean, Norwegian, Polish, Portuguese, Russian, Spanish and Swedish	
-01	S 1 copy			
-02	O 2 copies			
-03	O 3 copies			
99Q	SPARE PARTS CATALOGUE			
-00	S Without			
-01	O 1 copy			
-02	O 2 copies			
-03	O 3 copies			
99T	FUEL MAIN FILTER			
<i>Reversible fuel filters enable the switching of fuel filters during operation. This is required by classification societies in many applications.</i>				
-00	S Single fuel filter		Note! Approved for classification.	
-01	O Reversible dual fuel filter			
99U	FUEL HOSES			
-00	O Without			
-01	S With nipples			
-02	O With two fuel hoses			



5 ENGINE DATA 13-series

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General information

Standard equipment

Scania Engine Management System, EMS

Unit injectors, PDE

Turbocharger

Water-cooled charge air cooler (not for emergency/harbour engines)

Fuel pre-filter with water separator

Fuel filter

Oil filter, full flow

Centrifugal oil cleaner

Oil cooler, integrated in block

Oil filler, in engine block

Oil draining with plug

Oil dipstick, in block

Starter, 2-pole, 7.0 kW, (EMS controlled)

Alternator 2-pole, 100A

Flywheel SAE 14

Silumin flywheel housing, SAE1 flange

Front-mounted engine brackets

Protection covers

Sea water pump (only engines with heat exchanger)

Heat exchanger with expansion tank (only engines with heat exchanger)

Closed crankcase ventilation

Operator's manual

For optional equipment, see 'Equipment list'.

Note! No optional equipment is type approved for classification if not otherwise stated.

Ratings

PRP, Prime power For continuous operation and unlimited yearly operation at varying load. Max. mean load factor of 70% of rated power over 24 h of operation.
1 hour/12 hours period of accumulated peak overload to 110%.

Power definition acc. to ISO 8528.

Power test codes: ISO 3046, ISO 8528, DIN 6280 Dauerbetrieb.

Emission compliance and classification

For detailed information about approved and certified engines and classification society approvals, access SAIL at <http://sail.scania.com> to view or download the appropriate certificate.

Dual speed configuration

The engine speed can be switched between 1500 rpm (50 Hz) and 1800 rpm (60 Hz) via the Coordinator/EMS.

Note! that the default setting is 1500 rpm (50 Hz) from factory.

To manually change the nominal speed, see Electrical systems in the Installation manual or EMS CAN specifications on SAIL at <http://sail.scania.com>.



Engine programme

EU Stage IIIA¹, US Tier 2 and IMO Tier II compliant engines

With heat exchanger

Engine type	1500 rpm (50Hz)	1800 rpm (60Hz)	Factory order reference sequence			
	PRP	PRP				
	kW	kW	Rating	Engine speed	Output	Engine ref.
DI13 074M	323	376	13-03	35-20	12-42	04-01
DI13 074M	376	426	13-03	35-20	12-43	04-02
DI13 074M	426	426	13-03	35-20	12-44	04-03

With keel cooling

Engine type	1500 rpm (50Hz)	1800 rpm (60Hz)	Factory order reference sequence			
	PRP	PRP				
	kW	kW	Rating	Engine speed	Output	Engine ref.
DI13 075M	323	376	13-03	35-20	12-42	04-11
DI13 075M	376	426	13-03	35-20	12-43	04-12
DI13 075M	426	426	13-03	35-20	12-44	04-13

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Without heat exchanger and water-cooled CAC (emergency/harbour)

Engine type	1500 rpm (50Hz)	1800 rpm (60Hz)	Factory order reference sequence			
	PRP	PRP				
	kW	kW	Rating	Engine speed	Output	Engine ref.
DI13 075M	323	376	13-03	35-20	12-42	04-21
DI13 075M	376	426	13-03	35-20	12-43	04-22
DI13 075M	426	426	13-03	35-20	12-44	04-23

1) EU Stage IIIA only applies for propulsion engines with E2 test cycle.



Basic data

General

Configuration and number of cylinders	6 in-line	
Working principle	4-stroke	
Bore x stroke	130 x 160	mm
Displacement	12.7	dm ³
Compression ratio	16.3:1	
Firing order	1 - 5 - 3 - 6 - 2 - 4	
Piston speed		
at 1500 rpm	8.0	m/s
at 1800 rpm	9.6	m/s
Pistons	Steel pistons	
Camshaft	High position alloy steel	
Connection rods	I-section press forgings of alloy steel	
Crankshaft	Alloy steel with hardened and polished bearing surfaces	
Rotation, seen from flywheel end	Counter clockwise	
Total moment of inertia with flywheel		
SAE 14	3.11	kgm ²
Number of teeth on flywheel ring gear	158	
Weight approx. (excl. oil and coolant)		
with heat exchanger	1190	kg
with keel cooling	1140	kg
without heat exchanger and water-cooled CAC (emergency/harbour)	TBA	kg

Lubrication system

Oil capacity (deep front oil sump with ladder frame)		
min	39	dm ³
max	45	dm ³
Oil consumption	<0.2	g/kWh
Oil change intervals	500	h
Oil grade		
engines run on low-sulphur fuel	ACEA E5 or E7	
engines not run on low-sulphur fuel	Total Base Number (TBN) at least 12 (ASTM 2896)	
Oil pressure		
normal	3-6	bar
minimum permitted at idle speed	0.7	bar
Oil temperature		
normal	90-110	°C
Oil cleaner	Centrifugal	
filtration	5-7	Micron
Oil filter	Paper/Full flow	
Oil cooler	Water cooled/Full flow	

Injection system

Type	Unit injectors
Governor	Scania Engine Management System, EMS
Fuel filter	Paper filter element

**Cooling system**

Coolant volume

with heat exchanger	40	dm ³
with keel cooling, single circuit	26	dm ³
without heat exchanger and water-cooled CAC (emergency/harbour)	TBA	dm ³

Coolant temperature

with heat exchanger	90-95	°C
with keel cooling	83-88	°C
without heat exchanger and water-cooled CAC (emergency/harbour)	83-88	°C

Number of thermostats..... 1

Opening temperature

with heat exchanger	80/87	°C
with keel cooling	75	°C
without heat exchanger and water-cooled CAC (emergency/harbour)	75	°C

Intake system

Permissible pressure drop in intake system	mbar
with cleaned or new filter	30
Permissible pressure drop in intake system	mbar
with blocked (dirty) filter	65

Electrical system

Type	2-pole, 24V, DC
Starter, standard equipment.....	2-pole, 24V, 7.0 kW
Alternator, standard equipment	2-pole, 28V, 100A



Technical data

DI13 074M, 323-376 kW - With heat exchanger (engine ref. 04-01)

Emission compliance	Fuel injection system	Rating
EU Stage IIIA ¹⁾ , US Tier 2 and IMO Tier II	Unit injectors, PDE	PRP, Prime power

	Engine speed (rpm)		Unit
	1500	1800	
Gross power	323	376	kW
Gross torque	2056	2000	Nm
Spec. fuel consumption			
full load	200	205	g/kWh
3/4 load	200	202	g/kWh
1/2 load	205	205	g/kWh
Heat rejection			
to coolant	224	273	kW
to exhaust gas	216	261	kW
to surrounding air	15	18	kW
Air consumption	26	33	kg/min
Pressure in intake manifold	1.7	1.8	Bar
Exhaust flow	27	34	kg/min
Exhaust temperature	463	445	°C

1) EU Stage IIIA only applies for propulsion engines with E2 test cycle.



Technical data

DI13 074M, 376-426 kW - With heat exchanger (engine ref. 04-02)

Emission compliance	Fuel injection system	Rating
EU Stage IIIA ¹⁾ , US Tier 2 and IMO Tier II	Unit injectors, PDE	PRP, Prime power

	Engine speed (rpm)		Unit
	1500	1800	
Gross power	376	426	kW
Gross torque	2400	2260	Nm
Spec. fuel consumption			
full load	199	203	g/kWh
3/4 load	200	203	g/kWh
1/2 load	202	204	g/kWh
Heat rejection			
to coolant	260	303	kW
to exhaust gas	248	291	kW
to surrounding air	18	21	kW
Air consumption	29	34	kg/min
Pressure in intake manifold	2.0	2.0	Bar
Exhaust flow	30	36	kg/min
Exhaust temperature	476	472	°C

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1) EU Stage IIIA only applies for propulsion engines with E2 test cycle.



Technical data

DI13 074M, 426-426 kW - With heat exchanger (engine ref. 04-03)

Emission compliance	Fuel injection system	Rating
EU Stage IIIA ¹⁾ , US Tier 2 and IMO Tier II	Unit injectors, PDE	PRP, Prime power

	Engine speed (rpm)		Unit
	1500	1800	
Gross power	426	426	kW
Gross torque	2712	2260	Nm
Spec. fuel consumption			
full load	199	203	g/kWh
3/4 load	200	203	g/kWh
1/2 load	201	204	g/kWh
Heat rejection			
to coolant	295	303	kW
to exhaust gas	278	291	kW
to surrounding air	20	21	kW
Air consumption	31	34	kg/min
Pressure in intake manifold	2.2	2.0	Bar
Exhaust flow	32	36	kg/min
Exhaust temperature	494	472	°C

1) EU Stage IIIA only applies for propulsion engines with E2 test cycle.



Technical data

DI13 075M, 323-376 kW - With keel cooling, single circuit (engine ref. 04-11)

DI13 075M, 323-376 kW - Without heat exch. and water-cooled CAC (engine ref. 04-21)

Emission compliance	Fuel injection system	Rating
EU Stage IIIA ¹⁾ , US Tier 2 and IMO Tier II	Unit injectors, PDE	PRP, Prime power

	Engine speed (rpm)		Unit
	1500	1800	
Gross power	323	376	kW
Gross torque	2056	2000	Nm
Spec. fuel consumption			
full load	206	208	g/kWh
3/4 load	208	211	g/kWh
1/2 load	210	215	g/kWh
Heat rejection			
to coolant*	228	269	kW
<i>divided for engines w/o heat exch. and CAC:</i>			
- coolant	194	216	kW
- charge air	34	53	kW
to exhaust gas	233	280	kW
to surrounding air	16	19	kW
Air consumption	25	33	kg/min
Air temperature			
before charge air cooler	167	190	°C
after charge air cooler	80	87	°C
Pressure in intake manifold	1.8	2.1	Bar
Exhaust flow	26	34	kg/min
Exhaust temperature	512	474	°C

*Including charge air

5_B

1) EU Stage IIIA only applies for propulsion engines with E2 test cycle.



Technical data

DI13 075M, 376-426 kW - With keel cooling, single circuit (engine ref. 04-12)

DI13 075M, 376-426 kW - Without heat exch. and water-cooled CAC (engine ref. 04-22)

Emission compliance	Fuel injection system	Rating
EU Stage IIIA ¹⁾ , US Tier 2 and IMO Tier II	Unit injectors, PDE	PRP, Prime power

	Engine speed (rpm)		Unit
	1500	1800	
Gross power	376	426	kW
Gross torque	2400	2260	Nm
Spec. fuel consumption			
full load	203	203	g/kWh
3/4 load	207	210	g/kWh
1/2 load	209	213	g/kWh
Heat rejection			
to coolant*	262	291	kW
<i>divided for engines w/o heat exch. and CAC:</i>			
- coolant	217	230	kW
- charge air	45	61	kW
to exhaust gas	265	303	kW
to surrounding air	18	21	kW
Air consumption	27	34	kg/min
Air temperature			
before charge air cooler	187	200	°C
after charge air cooler	85	90	°C
Pressure in intake manifold	2.1	2.2	Bar
Exhaust flow	29	35	kg/min
Exhaust temperature	524	491	°C

*Including charge air

1) EU Stage IIIA only applies for propulsion engines with E2 test cycle.



Technical data

DI13 075M, 426-426 kW - With keel cooling, single circuit (engine ref. 04-13)

DI13 075M, 426-426 kW - Without heat exch. and water-cooled CAC (engine ref. 04-23)

Emission compliance	Fuel injection system	Rating
EU Stage IIIA ¹⁾ , US Tier 2 and IMO Tier II	Unit injectors, PDE	PRP, Prime power

	Engine speed (rpm)		Unit
	1500	1800	
Gross power	426	426	kW
Gross torque	2712	2260	Nm
Spec. fuel consumption			
full load	199	203	g/kWh
3/4 load	206	210	g/kWh
1/2 load	209	213	g/kWh
Heat rejection			
to coolant*	284	291	kW
<i>divided for engines w/o heat exch. and CAC:</i>			
- coolant	231	230	kW
- charge air	53	61	kW
to exhaust gas	288	303	kW
to surrounding air	20	21	kW
Air consumption	29	34	kg/min
Air temperature			
before charge air cooler	200	200	°C
after charge air cooler	88	90	°C
Pressure in intake manifold	2.3	2.2	Bar
Exhaust flow	30	35	kg/min
Exhaust temperature	536	491	°C

*Including charge air

5_B

1) EU Stage IIIA only applies for propulsion engines with E2 test cycle.



Basic dimensions

The basic dimensions are indicated with coordinates. The coordinate system is three dimensional and consists of three planes at straight angles to each other; x, y and z. The dimensions are indicated in mm from crankshaft centre.

DI13 074M - With heat exchanger

1 Air intake (Ø 150 mm)

1	x	+121
	y	-129
	z	+537

2 Exhaust outlet (Ø 117.35 mm)

2	x	-94
	y	+256
	z	+537

3 Sea water inlet (Ø 50 mm)

3	x	0
	y	+291
	z	+132

4 Sea water outlet (Ø 50 mm)

4	x	-428
	y	+452
	z	+315

5 Coolant drain (fresh water)

6 Fresh water filling

7 Fuel inlet (union nut M16x1.5)

7	x	-493
	y	-313
	z	+90

8 Fuel return (union nut M16x1.5)

8	x	-543
	y	-313
	z	+90

9 Oil filling in valve cover
(optional position)

10 Oil filling /dipstick

11 Oil drain plug

12 Connection from cab heater (M22x1.5)

12	x	-1016
	y	+347
	z	+90

13 Connection to cab heater (M18x1.5)
(remove lid to access)

13	x	-1229
	y	+108
	z	+396

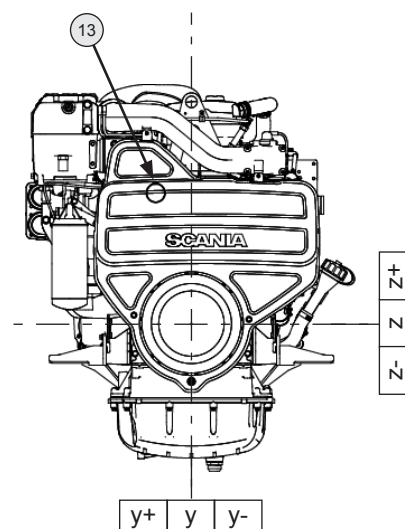
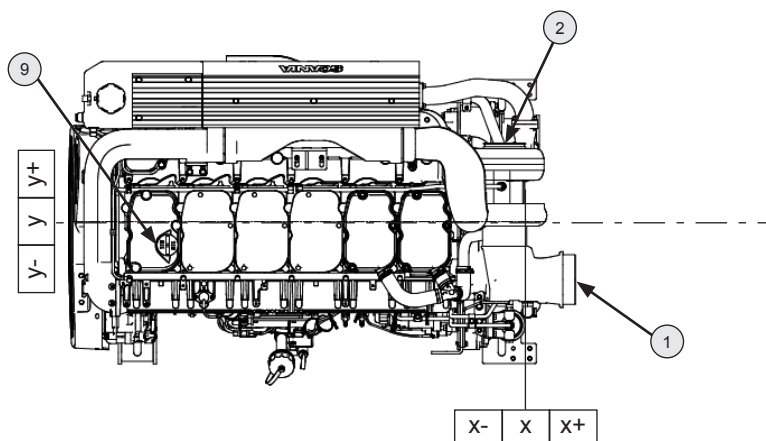
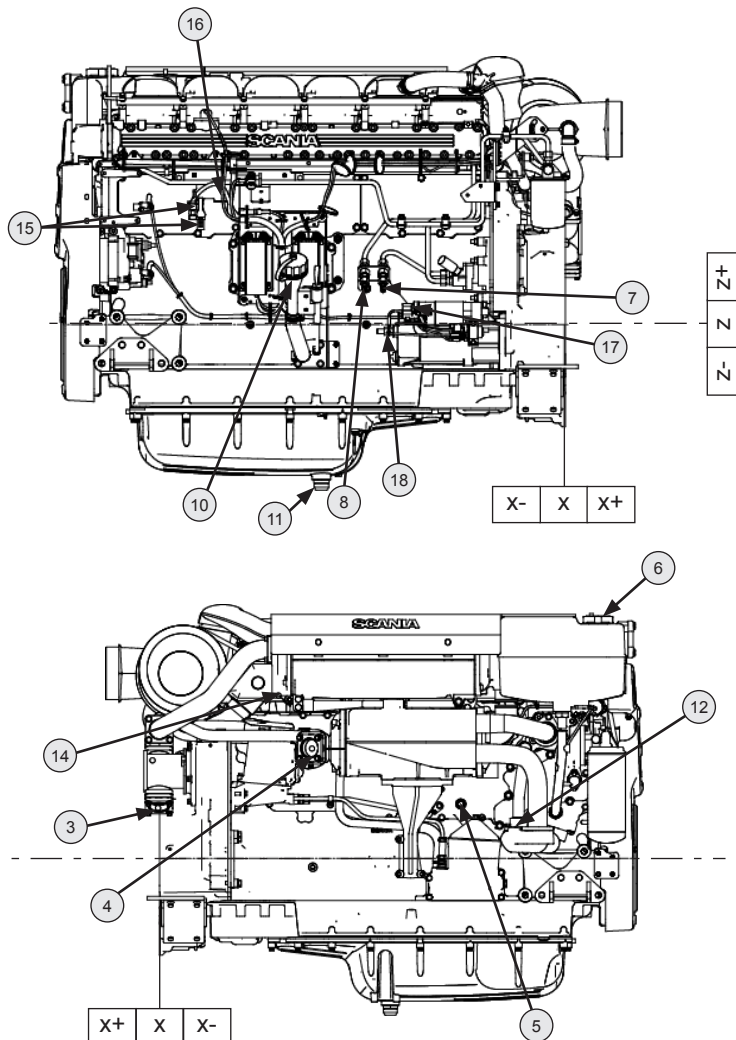
14 Sacrificial anode (2x)

15 Customer interface EMS

16 Diagnostic socket

17 Battery connection + (M10)

18 Battery connection - (M12)



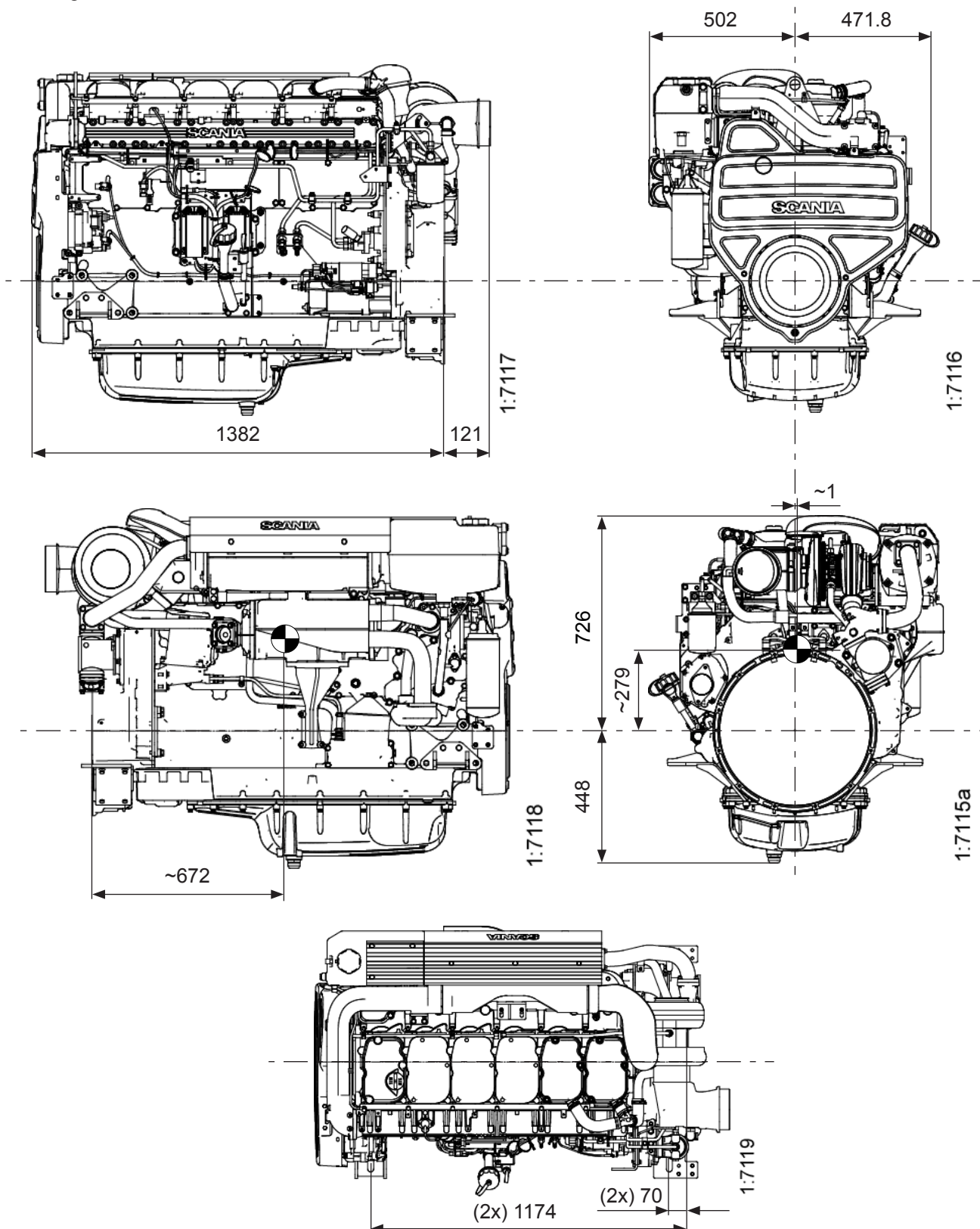


Dimensional drawings

All sketches are only intended as general sales information and must not be used for any installation purposes. The values for centre of gravity applies for engines with standard equipment including coolant. All dimensions are indicated in mm.

DI13 074M - With heat exchanger

Drawing no 1 866 386



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Basic dimensions

The basic dimensions are indicated with coordinates. The coordinate system is three dimensional and consists of three planes at straight angles to each other; x, y and z. The dimensions are indicated in mm from crankshaft centre.

DI13 075M - With keel cooling, single circuit

- 1 Air intake (Ø 150 mm)

1	x	+121
	y	-129
	z	+537

- 2 Exhaust outlet (Ø 117.35 mm)

2	x	-94
	y	+256
	z	+537

- 3 Main coolant inlet (Ø 50 mm)

3	x	-1081
	y	+465
	z	+220

- 4 Main coolant outlet (Ø 50 mm)

4	x	-1357
	y	+430
	z	+382

- 5 Coolant drain/filling (fresh water)

- 6 Fuel inlet (union nut M16x1.5)

6	x	-493
	y	-313
	z	+90

- 7 Fuel return (union nut M16x1.5)

7	x	-543
	y	-313
	z	+90

- 8 Oil filling/dipstick

- 9 Oil drain plug

- 10 Connection from cab heater (M22x1.5)

10	x	-1016
	y	+347
	z	+90

- 11 Connection to cab heater (M18x1.5)
(remove lid to access)

11	x	-1229
	y	+108
	z	+396

- 12 Customer interface EMS

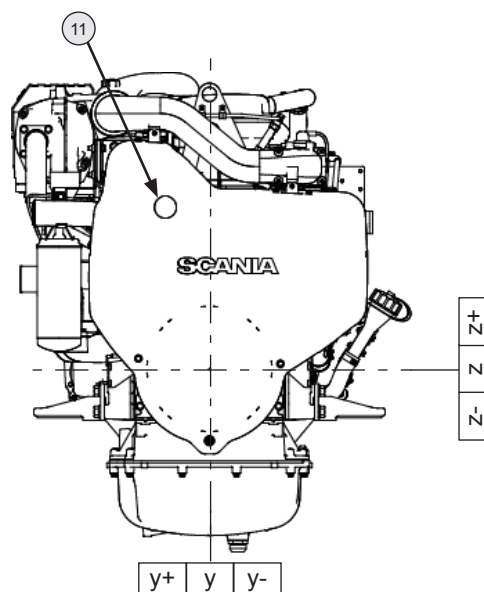
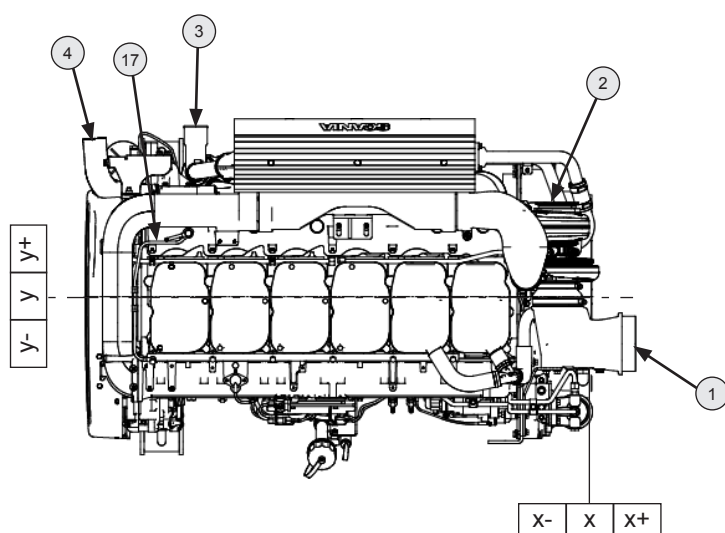
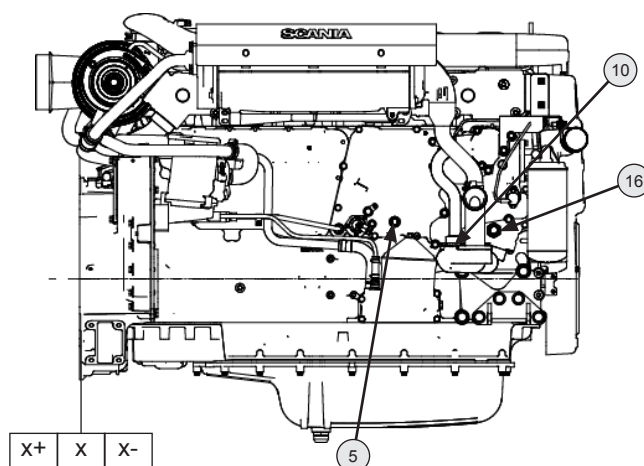
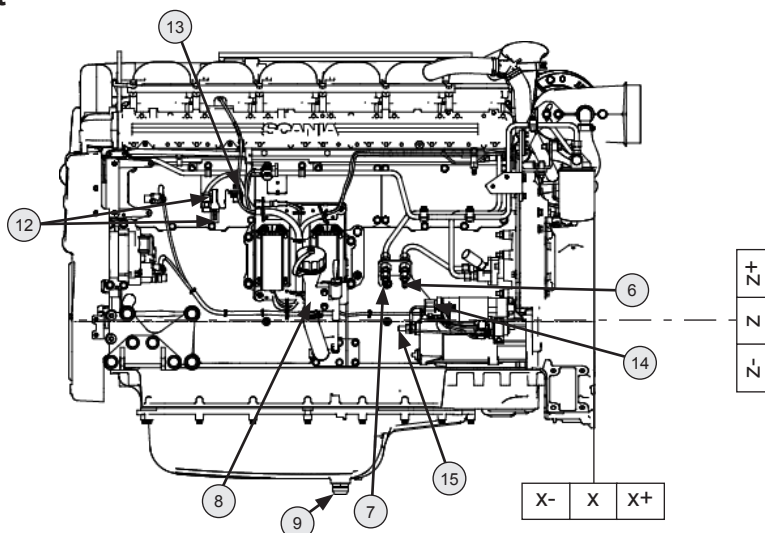
- 13 Diagnostic socket

- 14 Battery connection + (M10)

- 15 Battery connection - (M12)

- 16 Static line (Ø 25 mm)

- 17 Coolant bleed pipe (Ø 8 mm)



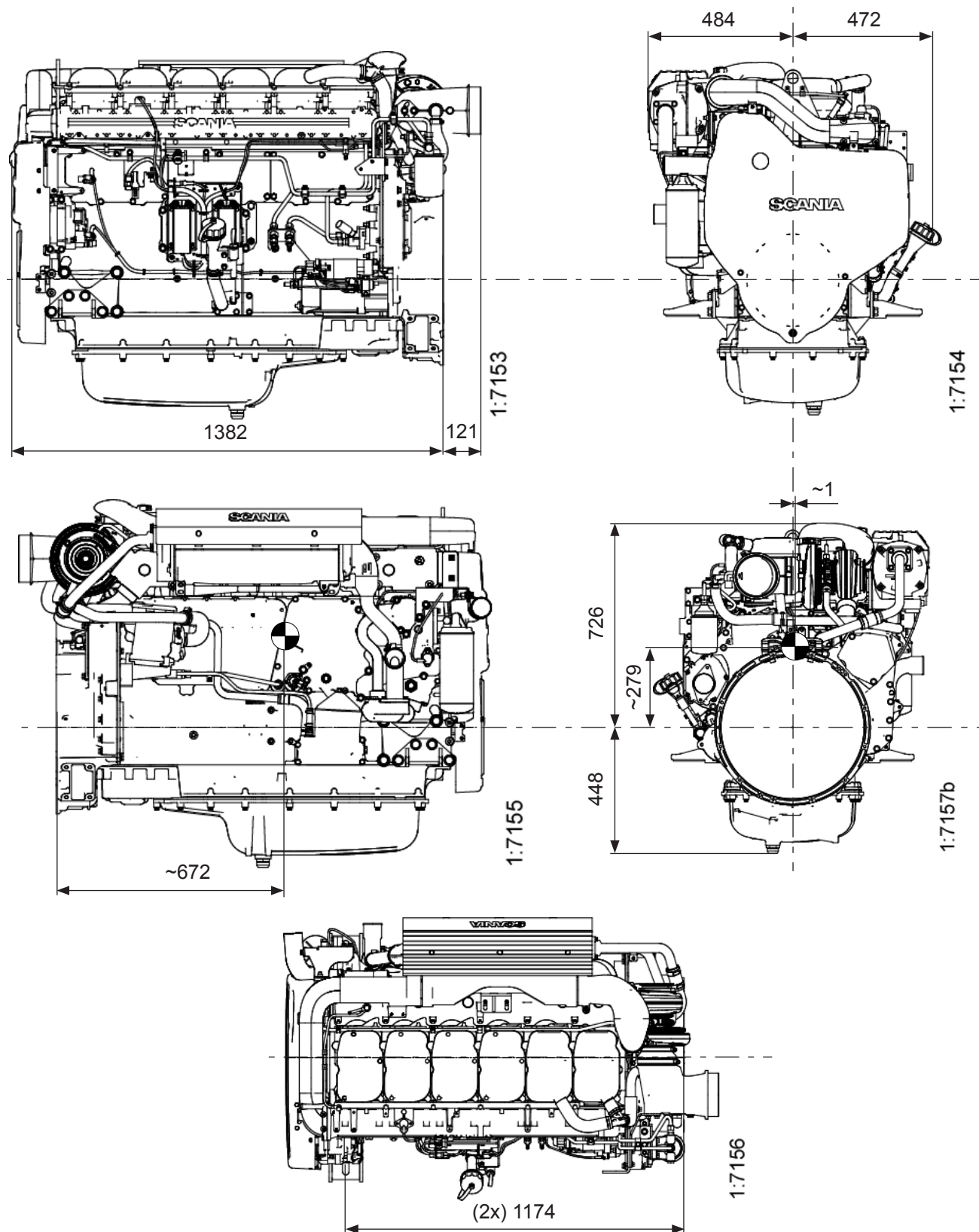


Dimensional drawings

All sketches are only intended as general sales information and must not be used for any installation purposes. The values for centre of gravity applies for engines with standard equipment including coolant. All dimensions are indicated in mm.

DI13 075M - With keel cooling, single circuit

Drawing no 1 866 384



5_B



Basic dimensions

The basic dimensions are indicated with coordinates. The coordinate system is three dimensional and consists of three planes at straight angles to each other; x, y and z. The dimensions are indicated in mm from crankshaft centre.

DI13 075M - Without heat exchanger and water-cooled CAC (emergency/harbour)

- 1 Air intake (Ø 150 mm)

1	x	+121
	y	-129
	z	+537

- 2 Exhaust outlet (Ø 117.35 mm)

2	x	-94
	y	+256
	z	+537

- 3 Main coolant inlet (Ø 50 mm)

3	x	-1081
	y	+465
	z	+220

- 4 Main coolant outlet (Ø 50 mm)

4	x	-1357
	y	+430
	z	+382

- 5 Coolant drain/filling (fresh water)

- 6 Fuel inlet (union nut M16x1.5)

6	x	-493
	y	-313
	z	+90

- 7 Fuel return (union nut M16x1.5)

7	x	-543
	y	-313
	z	+90

- 8 Oil filling/dipstick

- 9 Oil drain plug

- 10 Connection from cab heater (M18x1.5)

10	x	-1016
	y	+347
	z	+133

- 11 Connection to cab heater (M18x1.5)

11	x	-1229
	y	+108
	z	+396

- 12 Air in (from CAC) (Ø 89 mm)

12	x	-1298
	y	-223
	z	+626

- 13 Air out (to CAC) (Ø 89 mm)

13	x	-183
	y	+57
	z	+742

- 14 Customer interface EMS

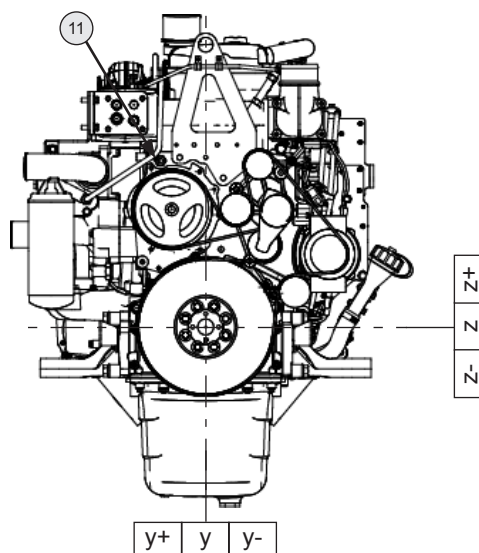
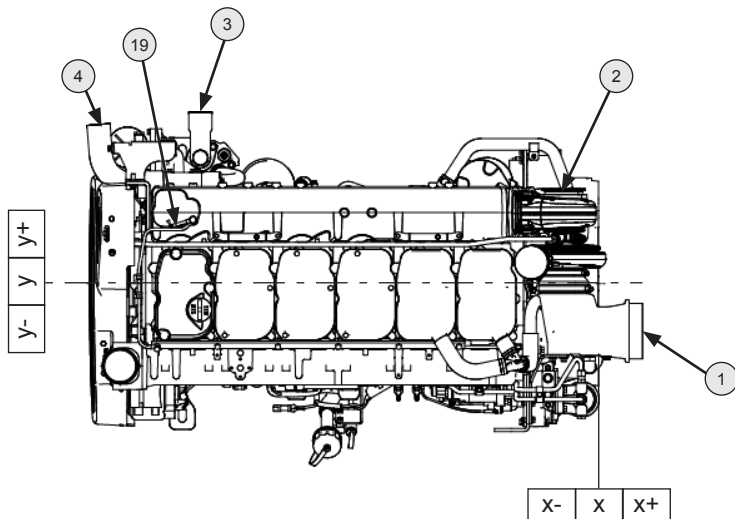
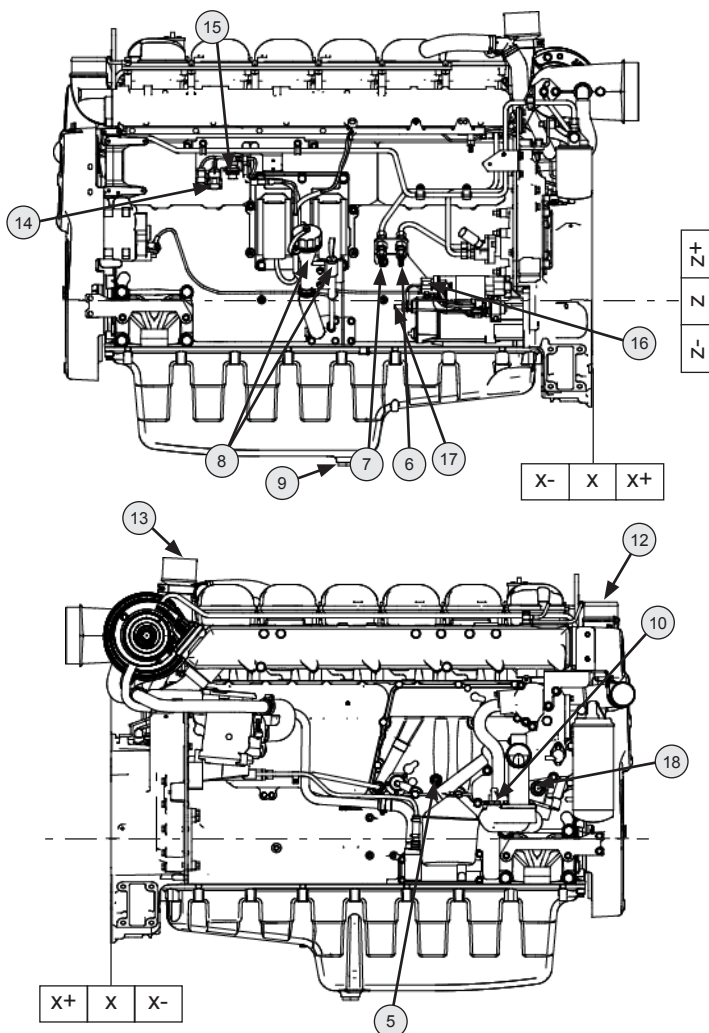
- 15 Diagnostic socket

- 16 Battery connection + (M10)

- 17 Battery connection - (M12)

- 18 Static line (Ø 25 mm)

- 19 Coolant bleed pipe (Ø 8 mm)



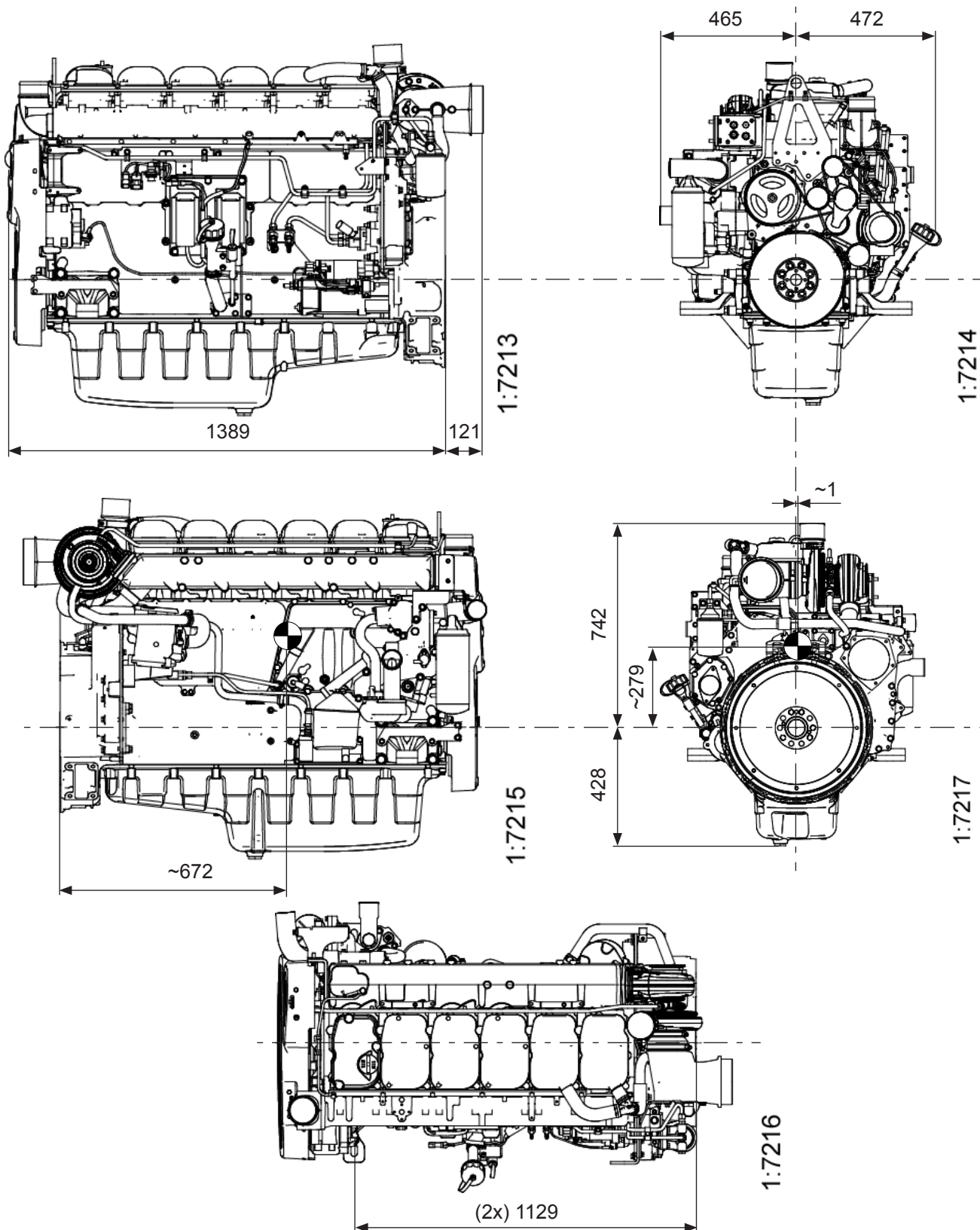


Dimensional drawings

All sketches are only intended as general sales information and must not be used for any installation purposes. The values for centre of gravity applies for engines with standard equipment including coolant. All dimensions are indicated in mm.

DI13 075M - Without heat exchanger and water-cooled CAC (emergency/harbour)

Drawing no 2 183 374

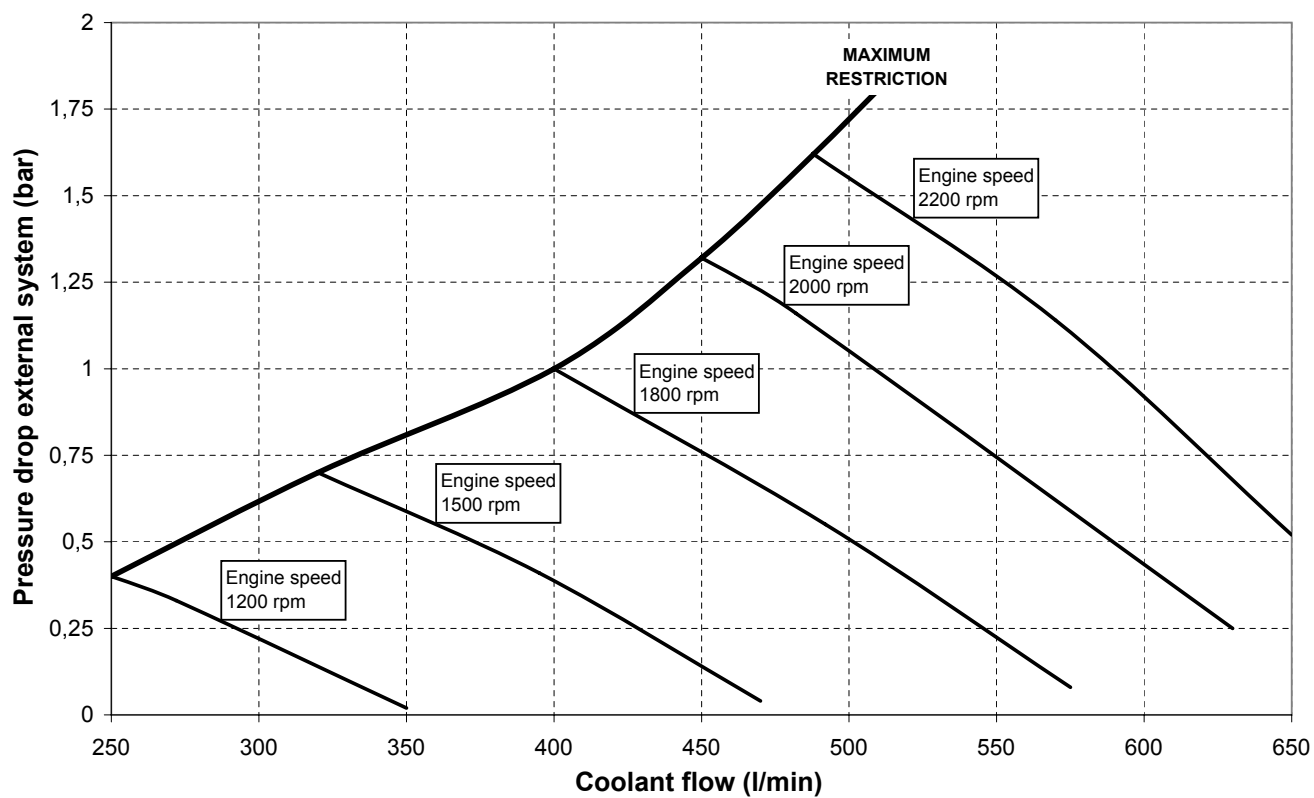


5_B



Coolant flow

The coolant flow depends on the pressure drop in the external system according to the graph below.
Valid for all DI13.





Equipment list

S = Standard

O = Optional

For illustrations and technical data, please see 'Equipment data'.

Drawings referred to in this section are available on Scania's Technical Information Library, TIL, under 'Drawings industrial & marine engines' or can be ordered via Pre-sales FRAS.

Ref	Description	Requirements	Remark	Drw No
10K	TORSIONAL VIBRATION CALCULATIONS			
-00	S Without			
-01	O Single engine installation with 1-3 driven masses. Typical genset or direct driven propeller installations.		Note! TVC can not be ordered directly.	
-02	O Several driven masses both behind and/or in front of the engine. Genset with auxiliary devices, propeller installations with front PTO, propeller installations with marine transmissions.		Torsional vibration calculations must be requested with the TVC form available at https://sail.scania.com and sent to factory for evaluation, before an actual order can be placed.	
-03	O Branched drive train, multi engine (advanced) installations, belt driven units etc.		If a TVC calculation has been rejected, further investigation is possible and will be charged per hour.	
10M	CLASSIFICATION			
	Note! For information about approved engines, access SAIL at http://sail.scania.com .			
-00	S Without			
-01	O ABS: American Bureau of Shipping	Req. 65-03		
-02	O BV: Bureau Veritas	Req. 65-02 or -03		
-03	O DNV: Det Norske Veritas	Req. 65-02 or -03		
-04	O GL: Germanischer Lloyd	Req. 65-02 or -03		
-05	O LR: Lloyds Register	Req. 65-03		
-06	O RINA: Registro Italiano Navale	Req. 65-03		
-11	O SF: Sjöfartsverket			
-12	O RS: Russian Maritime Register of Shipping	Req. 65-02 or -03		
-13	O RRR: Russian River Register			
-14	O CCS: China Classification Society	Req. 65-02 or -03		
-15	O TL: Türk Loydu	Req. 65-03		
-16	O CRS: Croatian Register of Shipping	Req. 65-02 or -03		



Ref	Description	Requirements	Remark	Drw No
100	TYPE OF IMO CERTIFICATE			
	<i>Note! Ships in Russia: All engines above 130 kW on vessels with flag state Russia, except emergency engines, must have EIAPP certificate issued by Russian Maritime Register of Shipping, 10O-05.</i>			
	<i>Note! Ships in China: All engines above 130 kW on vessels with flag state China, except emergency engines, must have EIAPP certificate issued by China Classification Society, 10O-06.</i>			
	<i>Note! EIAPP for German-flagged vessels will have an additional fee due to extra costs caused by the German Administration.</i>			
-00	S Without			
-01	O EIAPP certificate issued by Germanischer Lloyd - GL			
-02	O S.o.C certificate issued by Germanischer Lloyd - GL			
-05	O EIAPP certificate issued by Russian Maritime Register of Shipping - RS	Req. 10M-12	No EIAPP certificate will be issued if the engine is not classified by RS.	
-06	O EIAPP certificate issued by China Classification Society - CCS	Req. 10M-14	No EIAPP certificate will be issued if the engine is not classified by CCS.	
25A	CONNECTION EMS			
	<i>The connector kit contains pins and connector for connecting to the electrical interface on the engine. The customer will attach the wirings to the connectors himself.</i>			
-01	S With connector kit			
-02	O With cable 6.3 m incl. connector			
25B	OIL TEMP, Integrated oil temp. sensor			
-00	S Without			
-01	O With			
25C	COOLANT LEVEL MONITOR			
	<i>The coolant level monitor is used to ensure that the coolant level is not dropping below a critical level that leaves the temperature sensor in the air. If the temperature sensor is not in contact with the coolant, boiling will not be detected, causing a risk for engine damages. The coolant level monitor is strongly recommended since the engine room is mostly remote operated.</i>			
-00	S Without		Note! Requires a level monitor from an	
-01	O Level monitor 2-pole, normally closed (when mounted in application)	Req. 28F-01, -02, -03 or -04	external manufacturer.	
25D	STARTER			
-00	O Without			
-01	S 2-pole, 7kW			1 882 043
25E	ALTERNATOR			
	<i>In the selection of an alternator the total electrical consumption must be considered. It is essential that a reserve of electrical power is available in order to avoid voltage drop in the EMS and problems with equipment such as instrumentation and lighting.</i>			
-00	O Without			
-01	S 2-pole, 100A			1 743 548
-04	O 2-pole, 2 x 100A			1 743 548



Ref	Description	Requirements	Remark	Drw No
25F	ENGINE HEATER			
<i>The engine heater will ensure that the engine keeps a temperature level above the ambient for easier starting. Since a warm engine have less friction, emission and operates more smoothly due to warm oil it will be more environmental friendly and significantly reduce engine wear. Engine heater 1500W with thermostat is recommended for customers that will use the heater continuously. Engine heater 500W is recommended for installations with insufficient fusing for using 1500W.</i>				
-00	S Without			
-01	O 1500 W/230 V, plug in type		Only for engines with keel cooling and engines without heat exchanger and water-cooled CAC	1 722 729
-06	O 1500 W/115 V, plug in with thermostat			2 074 315
-07	O 1500 W/230 V, plug in with thermostat			2 074 315
-08	O 550 W/230 V, plug in with thermostat			2 074 315
-09	O 550 W/115 V, plug in with thermostat			2 074 315
25G	POWER CABLE BETWEEN ALTERNATOR AND STARTER			
<i>The power cable is the feeding cable from the alternator to the starter motor for charging the batteries. The cable is mandatory to have either supplied by Scania or by the customer. The alternator requires constant 24V connected at B+ in order to work correctly.</i>				
-00AO	Without			
-01AS	With, for single alternator configuration	Req. 25E-01	Note! The power cable is non-fused and not approved for classification.	
-02	O With, for double alternator configuration	Req. 25E-04		
25H	OIL LEVEL SENSOR			
<i>The oil level sensor enables the engine operator to electronically read the level of oil in the engine as a part of the daily inspection. It is a complement to oil dipstick. The signal must be taken care of by the customer directly from the sensor.</i>				
-00	S Without			
-02	O With, but without electrical connection (connected and monitored by customer)			1 891 846
26A	FINE TUNE POTENTIOMETER			
-00	S Without		Note! This option is not approved for integration in a classified electrical monitoring system	
-01	O With	Req.26B-01 or -02		
26B	COORDINATOR			
<i>The coordinator will enable communication between the engine and other equipment by converting digital CAN signals into analogue signals.</i>				
-00	S Without			
-01	O With, incl. connector kit	Req. 26K-01, -02, -03, -04	Note! This option is not approved for integration in a classified electrical monitoring system	1 793 627
-02	O With, incl.connector and cable harness 3m	Req. 26K-01, -02, -03, -04		1 793 627
26G	INSTRUMENT PANEL			
-00	S Without			
-03	O Instrument kit, containing gauges for oil pressure and coolant temp. monitoring		Note! This option is not approved for integration in a classified electrical monitoring system	



Ref	Description	Requirements	Remark	Drw No
26K	COORDINATOR SETTINGS			
-00	S	Without		
-01	O	Fine tune potentiometer active, without alarm at 0 rpm		
-02	O	Fine tune potentiometer active, with alarm at 0 rpm		
-03	O	Fine tune potentiometer inactive, with alarm at 0 rpm		
-04	O	Fine tune potentiometer inactive, without alarm at 0 rpm		
28B	ENGINE TEMP. REACTION (EMS parameter setting)			
High engine temp reaction, 28B-03 to -06, is recommended in applications where the engine is remotely operated.				
-01	S	Only alarm (default value)	Note! • For a classified engine: see applicable classification rules for the intended application. • Alarm is always included regardless of option. • Override possibility refer to engine stop only, not torque reduction.	
-02	O	Torque reduction on low limit		
-03	O	Engine stop on high limit		
-04	O	Engine stop on high limit and torque reduction on low limit		
-05	O	Engine stop on high limit (with override possibility)		
-06	O	Engine stop on high limit (with override possibility) and torque reduction on low limit		
28C	TEMP. LIMIT HIGH (EMS parameter setting)			
This temp. limit decides the engine temp HIGH alarm limit that are described in 28B-.				
-01	O	98°C		
-02	O	100°C		
-03	O	102°C		
-04	O	103°C		
-05	O	104°C		
-06	S	105°C (default value)		
28D	TEMP. LIMIT LOW (EMS parameter setting)			
This temp. limit decides the engine temp LOW alarm limit that are described in 28B-.				
-01	S	95°C (default value)		
-02	O	98°C		
-03	O	100°C	Not with 28C-01	
-04	O	103°C	Not with 28C-01, -02 or -03	
28E	LOW OIL PRESSURE REACTION (EMS parameter setting)			
Low oil pressure reaction -03 or -04 is recommended in applications where the engine is remotely operated.				
-01	S	Only alarm (default value)	Note! For a classified engine: see applicable classification rules for the intended application.	
-02	O	Torque reduction, ~30%		
-03	O	Engine stop		
-04	O	Engine stop with override		



Ref	Description	Requirements	Remark	Drw No
28F	LOW COOLANT LEVEL REACTION (EMS parameter setting)			
Low coolant level reaction -03 or -04 is recommended in applications where the engine is remotely operated. The option is only valid for engines with coolant level sensor, option 25C.				
-00	S Without	Req. 25C-00	Note! For a classified engine: see applicable classification rules for the intended application.	
-01	O Only alarm (default value if 25C-01)	Req. 25C-01		
-02	O Torque reduction, ~30%	Req. 25C-01		
-03	O Engine stop	Req. 25C-01		
-04	O Engine stop with override	Req. 25C-01		
28H	DROOP SETTINGS (EMS parameter setting)			
Droop setting for single speed engines. The value is defined as how much the engine speed increases from full load to zero load, in % in relation to nominal speed.				
-01	O 0%			
-02	O 2.0%			
-03	O 3.5%			
-04	S 4.0% (default value)			
-05	O 6.0%			
-06	O 8.0%			
-07	O 10.0%			
28I	GOVERNOR SETTING (EMS parameter setting)			
-01	S Normal (default value)		Note! The optional settings 28I-02 and -03 should not be chosen without consulting after sales services, these options may only come into question after tests have been made at site.	
-02	O Soft			
-03	O Stiff			
28J	RAMP START DELAY (EMS parameter setting)			
-01	S 0 seconds (default value)		Note! At start this is the time the engine speed shall remain at low idle speed before starting the ramp up to nominal operational speed.	
-02	O 2 seconds			
-03	O 5 seconds			
-04	O 10 seconds			
-05	O 30 seconds			
-06	O 60 seconds			
-07	O 90 seconds			
-08	O 120 seconds			
28K	RAMP UP RATE (EMS parameter setting)			
-01	O 100 rpm/seconds		This is the rate by which the engine speed ramps up, starting from low idle up to nominal operational speed after the delay value defined in Ramp start delay (Price ref. 28J)	
-02	O 200 rpm/seconds			
-03	O 300 rpm/seconds			
-04	O 400 rpm/seconds			
-05	S 500 rpm/seconds (default value)			



Ref	Description	Requirements	Remark	Drw No
28N	LOW IDLE SPEED (EMS parameter setting)			
	<i>The low idle speed is set at such a level that resonance frequencies (critical speeds) in the powertrain are avoided.</i>			
-01	O 500 rpm			
-02	O 550 rpm			
-03	O 600 rpm			
-04	S 650 rpm			
-05	O 700 rpm			
-06	O 750 rpm			
-07	O 800 rpm			
-08	O 850 rpm			
-09	O 900 rpm			
-10	O 950 rpm			
-11	S 1000 rpm (default value)			
-12	O 1050 rpm			
28O	THROTTLE SETTINGS (EMS parameter setting)			
	<i>Important to consider: Is there a risk for injuries of personnel or damages to equipment if the engine runs out of control?</i>			
-06	S Nominal speed 1500 / 1800 rpm (default value)			
-07	O Fine tune of nominal speed always active		Note! Price ref. 28O-07 is intended for customers who wish to mount a potentiometer directly to the EMS for fine tuning of the nominal engine speed	
28S	HIGH CHARGE TEMP REACTION			
	<i>High charge temp reaction 28S-03 to -06 is recommended in applications where the engine is remotely operated.</i>			
-01	S Only alarm		Note!	
-02	O Torque reduction on low limit		• For a classified engine: see applicable classification rules for the intended application.	
-03	O Engine stop on high limit		• Alarm is always included regardless of option.	
-04	O Engine stop on high limit and torque reduction on low limit		• Override possibility refer to engine stop only, not torque reduction.	
-05	O Engine stop on high limit (with override possibility)			
-06	O Engine stop on high limit (with override possibility) and torque reduction on low limit			
28U	SPLIT FUELING			
-00	S Without			
-01	O With			
45	FLYWHEEL			
-01	S SAE 14			1 925 825
46	FLYWHEEL HOUSING			
-01	S SAE1 flange			1 925 826



Ref	Description	Requirements	Remark	Drw No
49	ENGINE BRACKET			
<i>Main factors to consider when selecting engine suspension are installation height of the engine and forces applied to the engine and driven equipment due to operating conditions. For further information please see the Installation manual.</i> <i>All engine suspensions are available with:</i> - Front-mounted brackets - Front- and rear-mounted brackets or - Front-mounted brackets and prepared for rear-mounted brackets, which means that the surface on the flywheel housing intended for rear-mounted brackets is unpainted.				
-01 S	Fixed low 120 mm below the crankshaft		Front-mounted brackets	1 866 025
-01ZO	Fixed low 120 mm below the crankshaft		Front-mounted brackets. Prepared for rear-mounted brackets.	1 866 025
-02AO	Fixed low 120 mm below the crankshaft		Front- and rear-mounted bracket	1 866 025
-03 O	Power pack type 230 mm below the crankshaft		Front-mounted brackets	1 858 891
-03ZO	Power pack type 230 mm below the crankshaft		Front-mounted brackets. Prepared for rear-mounted brackets.	1 858 891
-04 O	Power pack type 230 mm below the crankshaft		Front- and rear-mounted brackets	1 858 891
-09 O	Fixed extra low 25 mm above the crankshaft		Front-mounted brackets	1 866 025
-09ZO	Fixed extra low 25 mm above the crankshaft		Front-mounted brackets. Prepared for rear-mounted brackets.	1 866 025
-10 O	Fixed extra low 25 mm above the crankshaft		Front- and rear-mounted bracket	1 866 025
49A	ENGINE SUSPENSION			
-00 S	Without			
-01 O	Stiff rubber suspension	Not with 49-02A,-04 or-10	Front	1 866 025
-02 O	Stiff rubber suspension	Req. 49-02A,-04 or-10	Front and rear	1 866 025
51	AIR CLEANER			
<i>The selection of air cleaner is dependent on the concentration of dust in the air that surrounds the engine.</i> <i>Light duty is suitable for applications working in low dust environment, ocean going. Medium duty is suitable for applications in dusty environments like river boats where dust from land easily can be carried to the vessel.</i>				
-01AS	Prepared			
-05 O	Light duty, Ø15".		Separately. Without hose.	1 925 175
-08 O	Medium duty, Ø15" incl. safety element and pre-cleaner.		Separately. Without hose.	1 925 176
-10 O	Light duty, Ø8"		Mounted on turbo charger	1 529 410
56	EXHAUST BEND			
-01 S	Without, but with turbo-mounted flange	Req. 57-00		1 866 302
-02 O	90° bend, adjustable direction	Req. 57-02, -03, -05, -06		1 866 302
-06 O	Water cooled, 90° bend, pointing rearwards	Req. 57-00	Note! Only for engines with heat exchanger	1 866 201



Ref	Description	Requirements	Remark	Drw No
57	EXHAUST FITTINGS			
-00	S Without			
-02	O Flange, Ø130 mm			1 866 302
-03	O Flange, Ø155 mm			1 866 302
-05	O Compensator and flange, Ø130 mm			1 866 302
-06	O Compensator and flange, Ø155 mm			1 866 302
60	OIL SUMP			
-01AS	Deep front oil sump			1 927 084
-03BO	Low oil sump			1 866 386
-04AO	Extra low oil sump	Not with 25H-02		2 122 395
60A	OIL DIPSTICK			
-01	S Short, left hand side, in block			2 060 862
-02	O Long, left hand side, rear in block	Req. 61-05B		1 866 386
60B	ENGINE OIL, FACTORY FILLED			
<i>The engine can be delivered with factory filled engine oil. This option is suitable for customers that are interested in reducing or eliminating the handling of oil in their production process.</i> <i>Engine oil: Scania LDF-3. Viscosity class: 10W-40. Outside temperature: -20°C - >+30°C.</i>				
-00	S Without			
-02	O For deep front oil sump	Req. 60-01A		
-04	O For low oil sump	Req. 60-03B		
-05	O For extra low oil sump	Req. 60-04A		
61	OIL FILLER			
-01A	S In engine block, left hand side	Req. 60A-01		2 060 862
-01B	O In valve cover, cyl 1, and engine block, left hand side	Req. 60A-01		2 060 862
-05B	O In valve cover, cyl 1, and engine block, rear left hand side	Req. 60A-02		1 866 386
62	OIL DRAINING			
<i>The selection of oil draining is dependent on the installation. Especially critical is the space available below and next to the oil drain plug. If space for a drain bucket is available, then the standard oil plug is preferred as a simple solution. The hand pump, or electrical pump, is used if the oil is drained to a level above the engine.</i>				
-01	S With plug			
-03	O With hand pump, right hand side		Delivered loose	1 859 139
-04	O With hand pump, left hand side		Delivered loose	1 859 139
-05	O With electric pump and 3-way cock on right hand side		Delivered loose	1 407 848
-06	O With electric pump and 3-way cock on left hand side		Delivered loose	1 407 848
65	CRANKSHAFT			
<i>The crankshaft is a part subject to special requirements regarding traceability by the class societies. For approval by specific class societies this might be a requirement, to be checked with the class society.</i>				
-01	S Not classified			
-02	O With 3.1 material certificate			
-03	O Classified by Lloyds Register			



Ref	Description	Requirements	Remark	Drw No
72	FAN			
<i>The selection of fan is dependent on the need for cooling of the engine. Factors that need to be considered are air pressure drop in the installation and necessary air flow. The fan is normally matched with the radiator chosen for the application.</i>				
-00	S Without			
-01	O Prepared for fan, ratio 1:0.9.	Req. 49-03, -03Z or -04	Note! Only for engines with keel cooling and engines without heat exchanger and water-cooled CAC	1 861 092
-15	O Pusher, Ø914 mm, ratio 1:0.9	Req. 49-03, -03Z or -04	Note! Only for engines with keel cooling and engines without heat exchanger and water-cooled CAC	1 918 483
72A	FAN SPACER LENGTH			
-01	S 116 mm	Req. 72-01		1 940 791
-02	O 70 mm	Req. 72-01		1 940 791
-03	O 86 mm	Req. 72-01		1 940 791
-04	O 96 mm	Req. 72-01		1 940 791
-05	O 125 mm	Req. 72-01		1 940 791
-06	O 136 mm	Req. 72-01		1 940 791
-08	O 170 mm	Req. 72-01		1 940 791
78	SEA WATER PUMP			
-00	S Without		Note! Only for engines with keel cooling and engines without heat exchanger and water-cooled CAC	
-01	S With		Note! Only for engines with heat exchanger	
-02	O With connection hoses		Note! Only for engines with heat exchanger	1866201
-03	O With connection tubes		Note! Only for engines with heat exchanger	1866201
78A	BILGE PUMP			
-00	S Without			
-01	O With one bilge pump	Req. 90-00 and 72-00 Not with 49-03, -03Z or -04		1 866 350
-02	O With two bilge pumps	Req. 90-00 and 72-00 Not with 49-03, -03Z or -04	For example to be used as one bilge pump and one flush pump.	1 866 350
78B	SEA WATER PUMP POSITION			
<i>For SAE B rear high position there is a risk for interference with large transmission housings or generators. In order to avoid interference in these cases SAE B low rear pointing forward is recommended.</i>				
-00	S Without		Note! Only for engines with keel cooling and engines without heat exchanger and water-cooled CAC	
-01AS	SAE B low rear pointing forward		Note! Only for engines with heat exchanger	1 866 201



Ref	Description	Requirements	Remark	Drw No
90	FRONT-MOUNTED POWER TAKE-OFF (PTO)			
A front-mounted PTO is suitable for applications that need high torques, for example large auxiliary pumps and air compressors. Normally the driven equipment is mounted separate from the engine.				
-00	S	Without		
-02	O	Crankshaft pulley with two extra grooves, Ø260 mm	Req. 72-00 Req. 78A-00	
-04	O	Crankshaft pulley with three extra grooves, Ø260 mm	Req. 72-00 Req. 78A-00	
-05	O	Stub shaft for connection of flexible coupling. Max torque 1200 Nm	Req. 72-00 Req. 78A-00	
-06	O	Stub shaft for connection of flexible coupling with crank shaft pulley with three extra grooves, Ø260 mm. Max torque 1200 Nm.	Req. 72-00 Req. 78A-00	
91	SIDE-MOUNTED POWER TAKE-OFF (PTO)			
A side-mounted PTO is used for low rated engine-mounted hydraulic pumps or compressors.				
-00	S	Without		
-01	O	Prepared for SAE B		
-02	O	SAE B, 2-hole, 13 teeth. Gear ratio 1:1.19. Pointing backwards.	Note! Max torque 250 Nm (continuous) Max torque 400 Nm (intermittent)	1 448 964
-03	O	SAE A, 2-hole, 9 teeth. Gear ratio 1:1.71. Pointing backwards.	Req. 93-00 Note! Max torque 100 Nm (continuous) Max torque 125 Nm (intermittent)	1 798 247
-04	O	SAE A and SAE B	Req. 93-00	
-05	O	SAE B, 2-hole, 13 teeth. Gear ratio 1:1.19. Low, pointing forward.	Req. 78B-00	1 945 647
-08	O	SAE A and SAE B low, pointing forward	Req. 78B-00 Req. 93-00	
93	HYDRAULIC PUMP			
-00	S	Without		
-01	O	Capacity 16 l/min at 170 bar intermittent, 25-30 bar continuous	Note! Without pressure reduction valve	1 757 131 1 449 167
-02	O	Capacity 25 l/min at 170 bar intermittent, 25-30 bar continuous	Note! Without pressure reduction valve	1 757 131 1 449 167
96C	STUDS IN FLYWHEEL HOUSING			
-00	S	Without		
-01	O	With		



Ref	Description	Requirements	Remark	Drw No
98C	FUEL PRE-FILTER			
<i>Fuel pre-filter is required for all Scania marine engines. Water will condensate in the tank and enter the fuel, thus a risk of engine disturbances. The fuel pre-filter separates water from the fuel. The option without is valid for customers who uses a non-Scania pre-filter.</i>				
-00	O Without		Note! 98C-00 requires a water separating pre-filter from an external manufacturer. If no filter is mounted the engine warranty is not valid.	
-01	S Single fuel filter with water separator	Req. 10M-00	Note! Not type approved by any classification society.	1 774 501
-03	O Reversible dual fuel filter with water separator		Note! Type approved by ABS and BV.	1 769 500
98D	CAB HEATER			
-00	S Without			
-01	O Prepared for cab heater connection front			
-02	O Prepared for cab heater connection rear		Note! Only for engines with heat exchanger	
99G	PAINTWORK			
-01	S Orange heavy duty quality / silver on warm parts			
99L	CRANKCASE VENTILATION			
-01	S Closed ventilation			1 866 026
99P	OPERATOR'S MANUAL			
-00	O Without		Note! If a preferred language is not specified when ordering, the operator's manual will be delivered in English. Available languages are: Chinese (simplified), Chinese (trad.), Czech, Danish, Dutch, English, Finnish, French, German, Italian, Japanese, Korean, Norwegian, Polish, Portuguese, Russian, Spanish and Swedish	
-01	S 1 copy			
-02	O 2 copies			
-03	O 3 copies			
99Q	SPARE PARTS CATALOGUE			
-00	S Without			
-01	O 1 copy			
-02	O 2 copies			
-03	O 3 copies			
99T	FUEL MAIN FILTER			
<i>Reversible fuel filters enable the switching of fuel filters during operation. This is required by classification societies in many applications.</i>				
-00	S Single fuel filter			
-01	O Reversible dual fuel filter		Note! Approved for classification.	
99U	FUEL HOSES			
-00	O Without			
-01	S With nipples			
-02	O With two fuel hoses			



6 ENGINE DATA

16-series

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General information

Standard equipment

Scania Engine Management System, EMS
Unit injectors, PDE
Twin turbochargers, heat insulated
Water-cooled charge air cooler
Fuel pre-filter with water separator
Fuel filter
Oil filter, full flow
Centrifugal oil cleaner
Oil cooler, integrated in block
Oil filler, in valve cover
Oil draining with plug
Oil dipstick, in block
Deep front oil sump
Starter, 2-pole, 7.0 kW, (EMS controlled)
Alternator 2-pole, 100A
Flywheel SAE 14
Silumin flywheel housing, SAE1 flange
Front-mounted engine brackets
Catwalk and cover for belt transmission
Sea water charge air cooler (engines with heat exchanger only)
Sea water pump (engines with heat exchanger only)
Dual heat exchangers (engines with heat exchanger only)
Closed crankcase ventilation
Operator's manual

For optional equipment, see 'Equipment list'.

Note! No optional equipment is type approved for classification if not otherwise stated.

Ratings

ICFN, Continuous service	Rated power available 1 h/1 h. Unlimited h/year service time at a total load factor of 100%.
IFN, Intermittent service	Intended for intermittent use where rated power is available 1 hour/3 hours period. Accumulated load factor must not exceed 80% of rated power. Unlimited h/year service time.
Patrol craft long	Intended for intermittent use where rated power is available 1 hour/6 hours period. Between full load operations engine rpm must be reduced at least 10% from max. obtained rpm. Accumulated total service time max. 2000 h/year.
Patrol craft short	Intended for intermittent use where rated power is available 1 hour/12 hours period. Between full load operations engine rpm must be reduced at least 10% from max. obtained rpm. Accumulated total service time max. 1200 h/year.

Emission compliance and classification

For detailed information about approved and certified engines and classification society approvals, access SAIL at <http://sail.scania.com> to view or download the appropriate certificate.



Engine programme

EU Stage IIIA, US Tier 2 and IMO Tier II compliant engines

With heat exchanger

Engine type	ICFN 1800 rpm		IFN 2100 rpm		Patrol Craft Long 2300 rpm		Patrol Craft Short 2300 rpm		Factory order reference sequence			
	kW	hp	kW	hp	kW	hp	kW	hp	Rating	Engine speed	Output	Engine ref.
DI16 070M	405	550							13-01	35-02	12-09	03-01
DI16 070M	460	625							13-01	35-02	12-51	03-02
DI16 070M	515	700							13-01	35-02	12-53	03-03
DI16 070M	552	750							13-01	35-02	12-54	03-04
DI16 072M					588	800			13-02	35-06	12-55	03-25
DI16 072M					625	850			13-02	35-06	12-56	03-26
DI16 072M							662	900	13-02	35-06	12-57	03-27
DI16 077M*					662*	900*			13-02	35-06	12-57	03-41
DI16 077M*							736*	1000*	13-02	35-06	12-58	03-42

*) Note! Optimized for Water Jet applications. Not intended for conventional propeller use.

With keel cooling

Engine type	ICFN 1800 rpm		IFN 2100 rpm		Patrol Craft Long 2300 rpm		Patrol Craft Short 2300 rpm		Factory order reference sequence			
	kW	hp	kW	hp	kW	hp	kW	hp	Rating	Engine speed	Output	Engine ref.
DI16 071M	405	550							13-01	35-02	12-09	03-11
DI16 071M	460	625							13-01	35-02	12-51	03-12



EU Stage IIIA and IMO Tier II compliant engines

With heat exchanger

Engine type	ICFN 1800 rpm		IFN 2100 rpm		Patrol Craft Long 2300 rpm		Patrol Craft Short 2300 rpm		Factory order reference sequence			
	kW	hp	kW	hp	kW	hp	kW	hp	Rating	Engine speed	Output	Engine ref.
DI16 072M			478	650					13-02	35-04	12-52	03-21
DI16 072M			515	700					13-02	35-04	12-53	03-22
DI16 072M			552	750					13-02	35-04	12-15	03-23
DI16 072M			588	800					13-02	35-04	12-55	03-24

With keel cooling

Engine type	ICFN 1800 rpm		IFN 2100 rpm		Patrol Craft Long 2300 rpm		Patrol Craft Short 2300 rpm		Factory order reference sequence			
	kW	hp	kW	hp	kW	hp	kW	hp	Rating	Engine speed	Output	Engine ref.
DI16 073M			478	650					13-02	35-04	12-52	03-31
DI16 073M			515	700					13-02	35-04	12-11	03-32
DI16 073M			552	750					13-02	35-04	12-15	03-33
DI16 073M			588	800					13-02	35-04	12-55	03-34
DI16 079M	405	550							13-01	35-02	12-09	03-51
DI16 079M	460	625							13-01	35-02	12-51	03-52
DI16 079M	515	700							13-01	35-02	12-11	03-53
DI16 079M	552	750							13-01	35-02	12-54	03-54



Basic data

General

Configuration and number of cylinders	V 8	
Working principle	4-stroke	
Bore x stroke	130 x 154	mm
Displacement	16.4	dm ³
Compression ratio		
with heat exchanger	16.7:1	
with keel cooling	17.4:1	
Firing order	1 - 5 - 4 - 2 - 6 - 3 - 7 - 8	
Piston speed		
at 1500 rpm	7.7	m/s
at 1800 rpm	9.24	m/s
Pistons	Steel pistons	
Camshaft	High position alloy steel	
Connection rods	I-section press forgings of alloy steel	
Crankshaft	Alloy steel with hardened and polished bearing surfaces	
Rotation, seen from flywheel end	Counter clockwise	
Total moment of inertia with flywheel		
SAE 14	3.48	kgm ²
Number of teeth on flywheel ring gear	158	
Weight approx. (excl. oil and coolant)		
with heat exchanger	1670	kg
with keel cooling	1600	kg

Lubrication system

Oil capacity (deep front oil sump)		
min	40	dm ³
max	48	dm ³
Oil consumption	<0.3	g/kWh
Oil change intervals	500	h
Oil grade		
engines run on low-sulphur fuel	ACEA E5 or E7	
engines not run on low-sulphur fuel	Total Base Number (TBN) at least 12 (ASTM 2896)	
Oil pressure		
normal	3-6	bar
minimum permitted at idle speed	0.7	bar
Oil temperature		
normal	90-110	°C
Oil cleaner	Centrifugal	
filtration	5-7	Micron
Oil filter	Paper/Full flow	
Oil cooler	Water cooled/Full flow	

Injection system

Type	Unit injectors
Governor	Scania Engine Management System, EMS
Fuel filter	Paper filter element

**Cooling system**

Coolant volume

with heat exchanger	63	dm ³
with keel cooling, single circuit	53	dm ³
with keel cooling, double circuit	50	dm ³

Coolant temperature

with heat exchanger	86-91	°C
with keel cooling	78-83	°C

Number of thermostats

with heat exchanger	2
with keel cooling	1

Opening temperature

with heat exchanger	80/87	°C
with keel cooling	75	°C

Intake system

Permissible pressure drop in intake system

with cleaned or new filter	30	mbar
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Permissible pressure drop in intake system

with blocked (dirty) filter	65	mbar
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Electrical system

Type	2-pole, 24V, DC
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Starter, standard equipment	2-pole, 24V, 7.0 kW
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Alternator, standard equipment	2-pole, 28V, 100A
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Technical data

DI16 070M, 405 kW / 550 hp - With heat exchanger (engine ref. 03-01)

Emission compliance	Fuel injection system	Rating
EU Stage IIIA, US Tier 2, IMO Tier II	PDE	ICFN, Continuous service

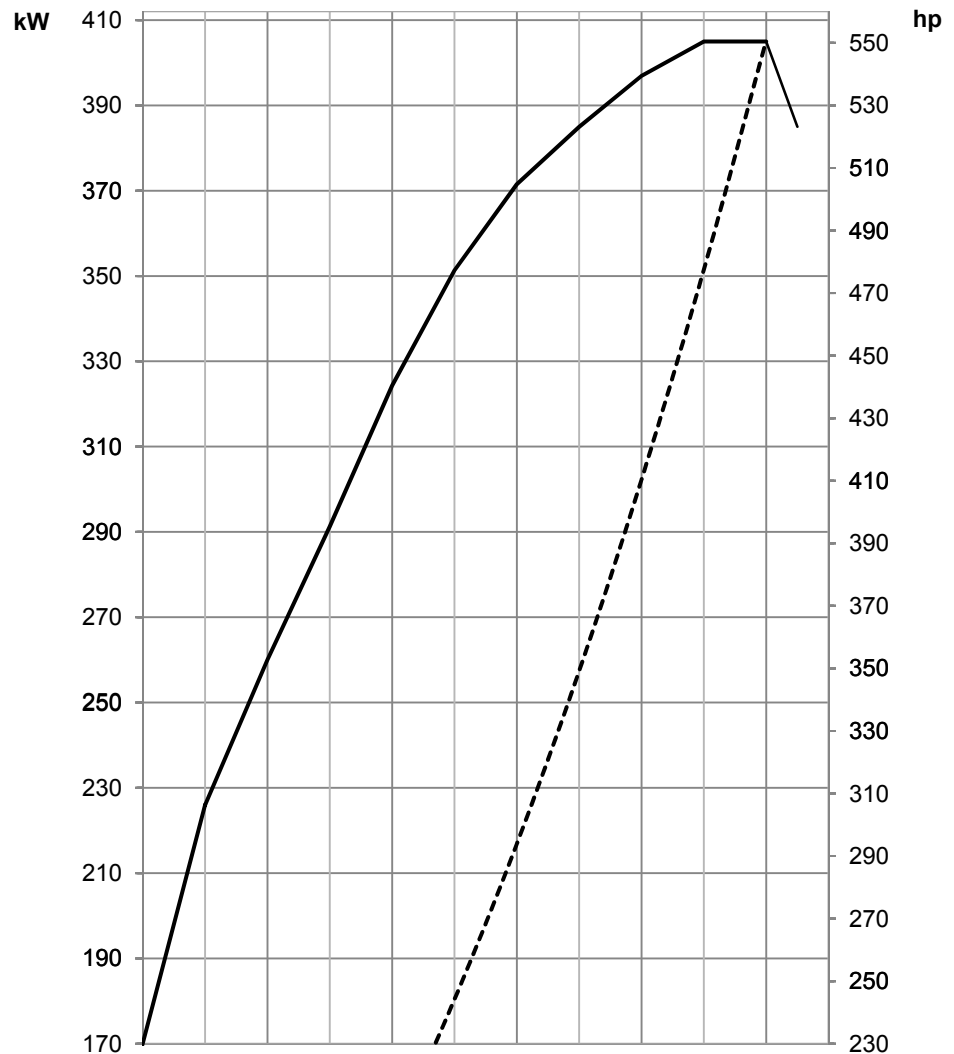
	Engine speed (rpm)				Unit
	1200	1500	1700	1800	
Gross power					
Full load curve	324	385	405	405	kW
	441	524	550	550	hp
Propeller curve (assumed exponent 2.5)	147	257	351	405	kW
	200	349	477	550	hp
Gross torque	2581	2451	2275	2149	Nm
Spec. fuel consumption					
full load	198	201	198	208	g/kWh
3/4 load	197	202	200	211	g/kWh
1/2 load	205	203	204	218	g/kWh
Propeller curve (assumed exponent 2.5)	36	62	83	100	l/h
Heat rejection					
to coolant	242	286	295	321	kW
to exhaust gas	183	232	237	258	kW
to surrounding air	15	18	19	20	kW
Air consumption	20	29	34	39	kg/min
Pressure in intake manifold	1.0	1.3	1.3	1.5	Bar
Exhaust flow	21	30	35	40	kg/min
Exhaust temperature	507	453	401	393	°C



DI16 070M, 405 kW / 550 hp - With heat exchanger (engine ref. 03-01)

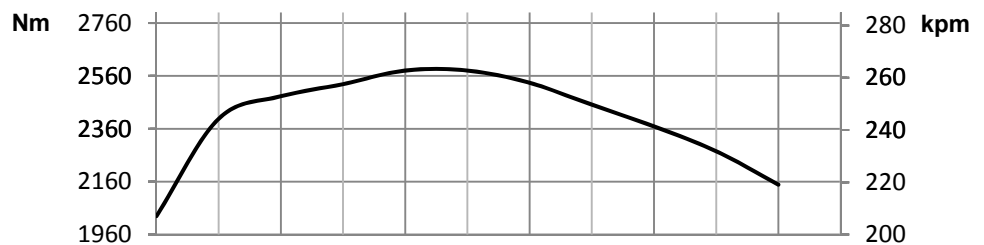
Power

(kW x 1.36 = hp)



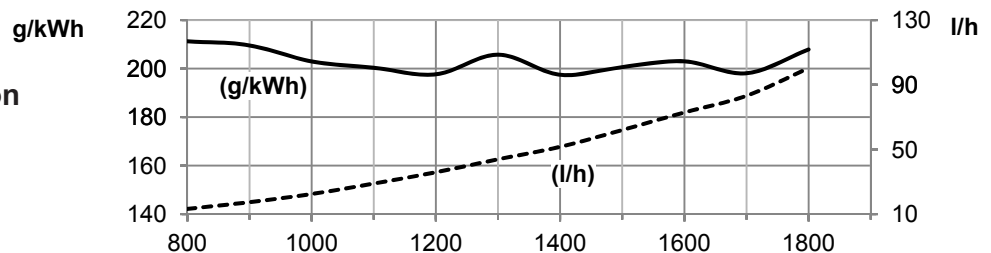
Torque

(Nm / 9.81 = kpm)



Spec. fuel consumption

(g/kWh / 1.36 = g/hph)



----- Propeller curve, assumed exponent 2.5
— Full load curve



Technical data

DI16 070M, 460 kW / 625 hp - With heat exchanger (engine ref. 03-02)

Emission compliance:	Fuel injection system	Rating
EU Stage IIIA, US Tier 2, IMO Tier II	PDE	ICFN, Continuous service

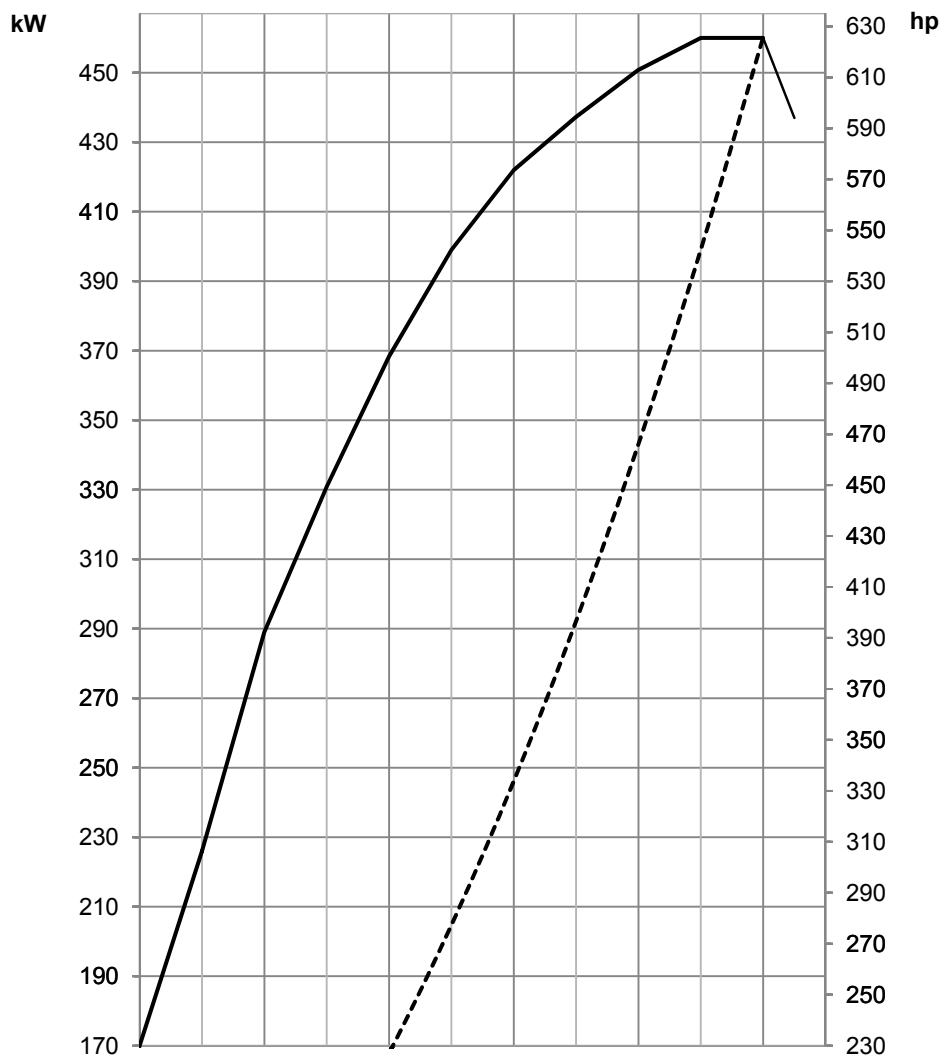
	Engine speed (rpm)				Unit
	1200	1500	1700	1800	
Gross power					
Full load curve	368	437	460	460	kW
	501	595	625	625	hp
Propeller curve (assumed exponent 2.5)	167	292	399	460	kW
	227	397	542	625	hp
Gross torque	2931	2784	2584	2440	Nm
Spec. fuel consumption					
full load	199	199	198	204	g/kWh
3/4 load	197	202	199	208	g/kWh
1/2 load	203	202	201	215	g/kWh
Propeller curve (assumed exponent 2.5)	41	70	94	112	l/h
Heat rejection					
to coolant	278	320	335	354	kW
to exhaust gas	210	260	268	284	kW
to surrounding air	17	21	22	22	kW
Air consumption	22	32	37	41	kg/min
Pressure in intake manifold	1.2	1.5	1.6	1.7	Bar
Exhaust flow	23	33	39	42	kg/min
Exhaust temperature	526	463	418	406	°C



DI16 070M, 460 kW / 625 hp - With heat exchanger (engine ref. 03-02)

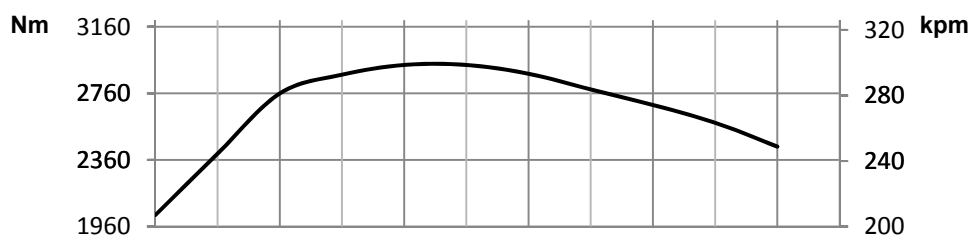
Power

(kW x 1.36 = hp)



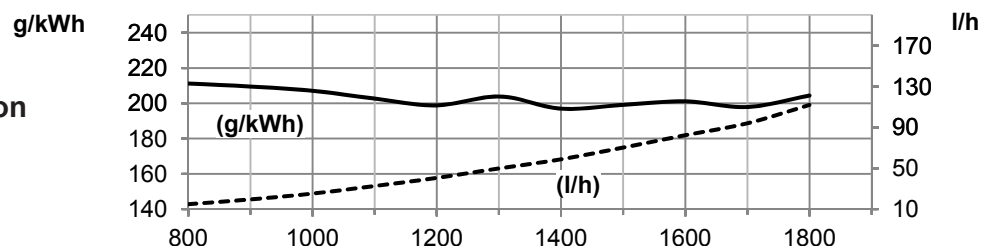
Torque

(Nm / 9.81 = kpm)



Spec. fuel consumption

(g/kWh / 1.36 = g/hph)



----- Propeller curve, assumed exponent 2.5
—— Full load curve



Technical data

DI16 070M, 515 kW / 700 hp - With heat exchanger (engine ref. 03-03)

Emission compliance:	Fuel injection system	Rating
EU Stage IIIA, US Tier 2, IMO Tier II	PDE	ICFN, Continuous service

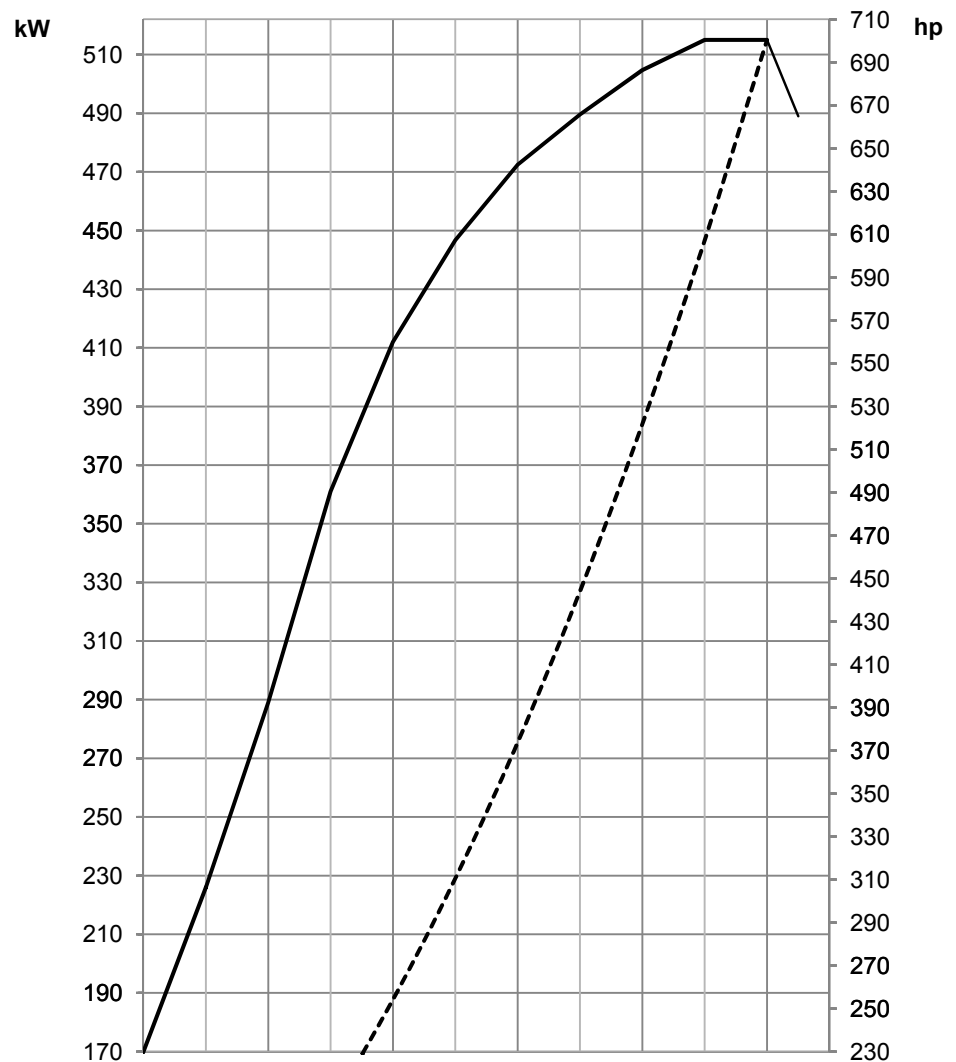
	Engine speed (rpm)				Unit
	1200	1500	1700	1800	
Gross power					
Full load curve	412	490	515	515	kW
	561	666	700	700	hp
Propeller curve (assumed exponent 2.5)	187	326	446	515	kW
	254	444	607	700	hp
Gross torque	3281	3117	2893	2732	Nm
Spec. fuel consumption					
full load	201	198	198	202	g/kWh
3/4 load	197	201	198	208	g/kWh
1/2 load	201	203	201	214	g/kWh
Propeller curve (assumed exponent 2.5)	45	78	105	124	l/h
Heat rejection					
to coolant	316	356	377	387	kW
to exhaust gas	240	286	302	311	kW
to surrounding air	20	23	24	25	kW
Air consumption	24	34	40	43	kg/min
Pressure in intake manifold	1.4	1.7	1.8	1.8	Bar
Exhaust flow	25	35	42	44	kg/min
Exhaust temperature	542	475	436	418	°C



DI16 070M, 515 kW / 700 hp - With heat exchanger (engine ref. 03-03)

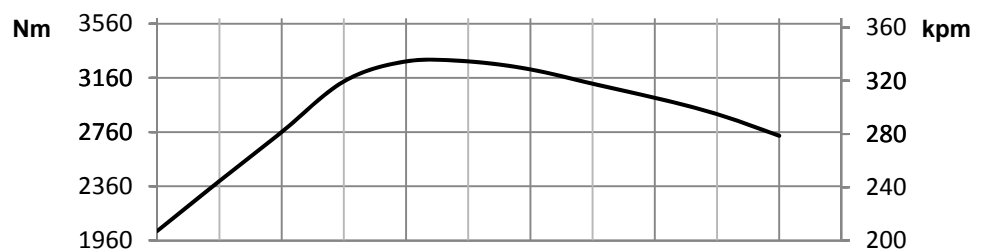
Power

(kW x 1.36 = hp)



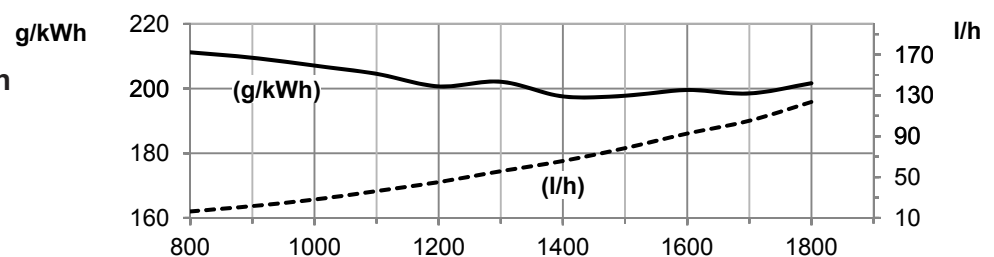
Torque

(Nm / 9.81 = kpm)



Spec. fuel consumption

(g/kWh / 1.36 = g/hph)



----- Propeller curve, assumed exponent 2.5
— Full load curve



Technical data

DI16 070M, 552 kW / 750 hp - With heat exchanger (engine ref. 03-04)

Emission compliance:	Fuel injection system	Rating
EU Stage IIIA, US Tier 2, IMO Tier II	PDE	ICFN, Continuous service

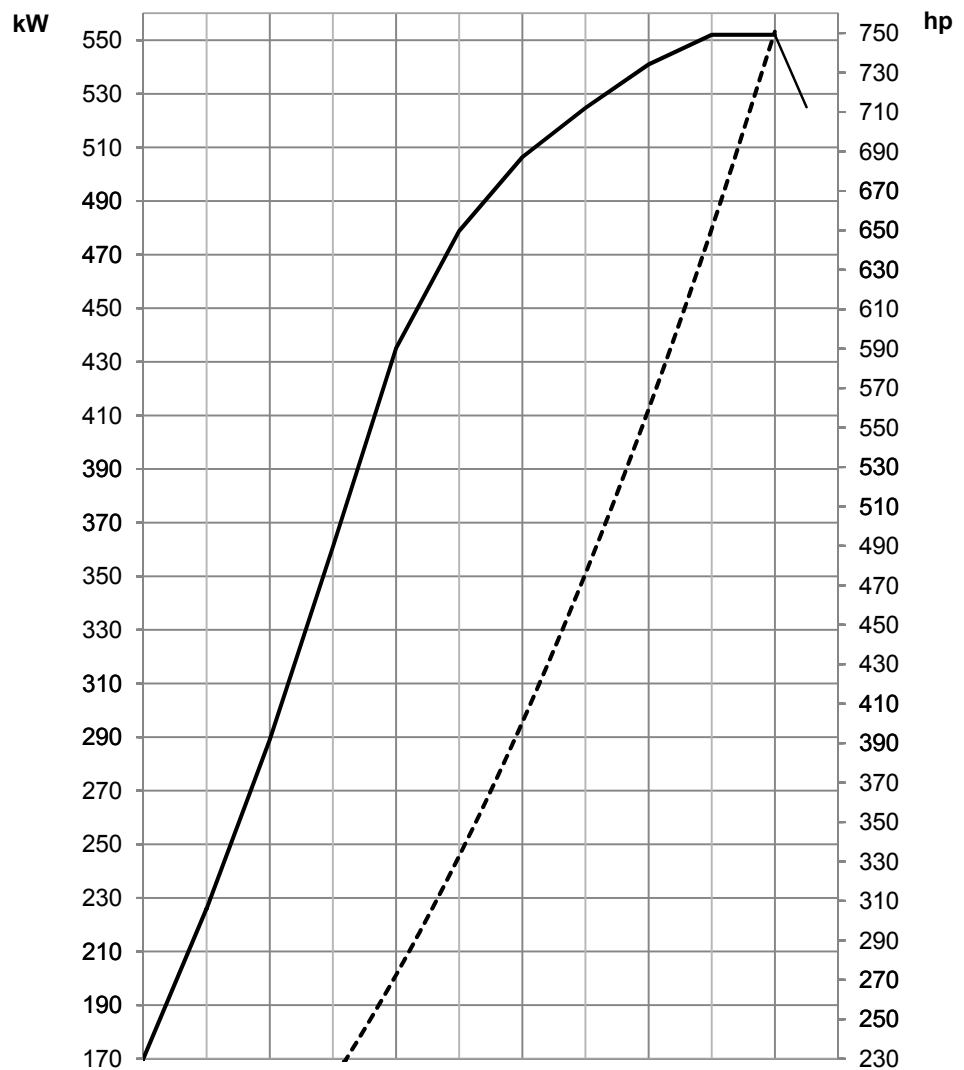
	Engine speed (rpm)				Unit
	1200	1500	1700	1800	
Gross power					
Full load curve	435	525	552	552	kW
	592	714	750	750	hp
Propeller curve (assumed exponent 2.5)	200	350	478	552	kW
	272	476	651	750	hp
Gross torque	3462	3341	3101	2928	Nm
Spec. fuel consumption					
full load	202	198	200	203	g/kWh
3/4 load	198	200	198	207	g/kWh
1/2 load	199	203	201	213	g/kWh
Propeller curve (assumed exponent 2.5)	48	84	113	133	l/h
Heat rejection					
to coolant	338	382	409	418	kW
to exhaust gas	253	306	328	337	kW
to surrounding air	21	25	26	26	kW
Air consumption	25	36	42	44	kg/min
Pressure in intake manifold	1.5	1.8	1.9	1.9	Bar
Exhaust flow	26	37	44	46	kg/min
Exhaust temperature	547	480	447	431	°C



DI16 070M, 552 kW / 750 hp - With heat exchanger (engine ref. 03-04)

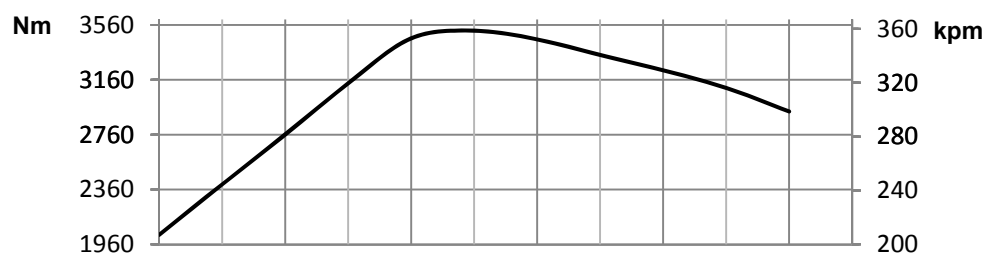
Power

(kW x 1.36 = hp)



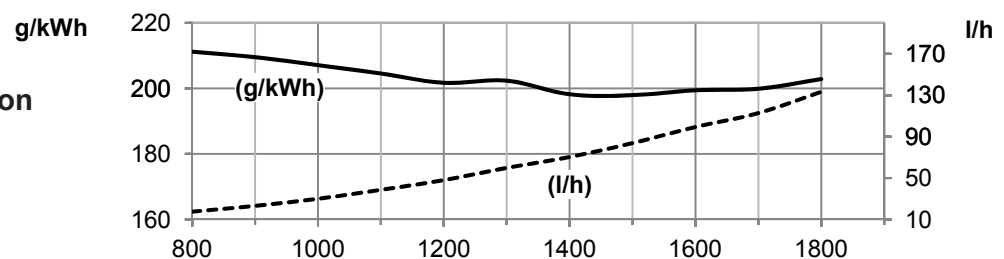
Torque

(Nm / 9.81 = kpm)



Spec. fuel consumption

(g/kWh / 1.36 = g/hph)



----- Propeller curve, assumed exponent 2.5
—— Full load curve



Technical data

DI16 072M, 478 kW / 650 hp - With heat exchanger (engine ref. 03-21)

Emission compliance:	Fuel injection system	Rating
EU Stage IIIA, IMO Tier II	PDE	IFN, Intermittent service

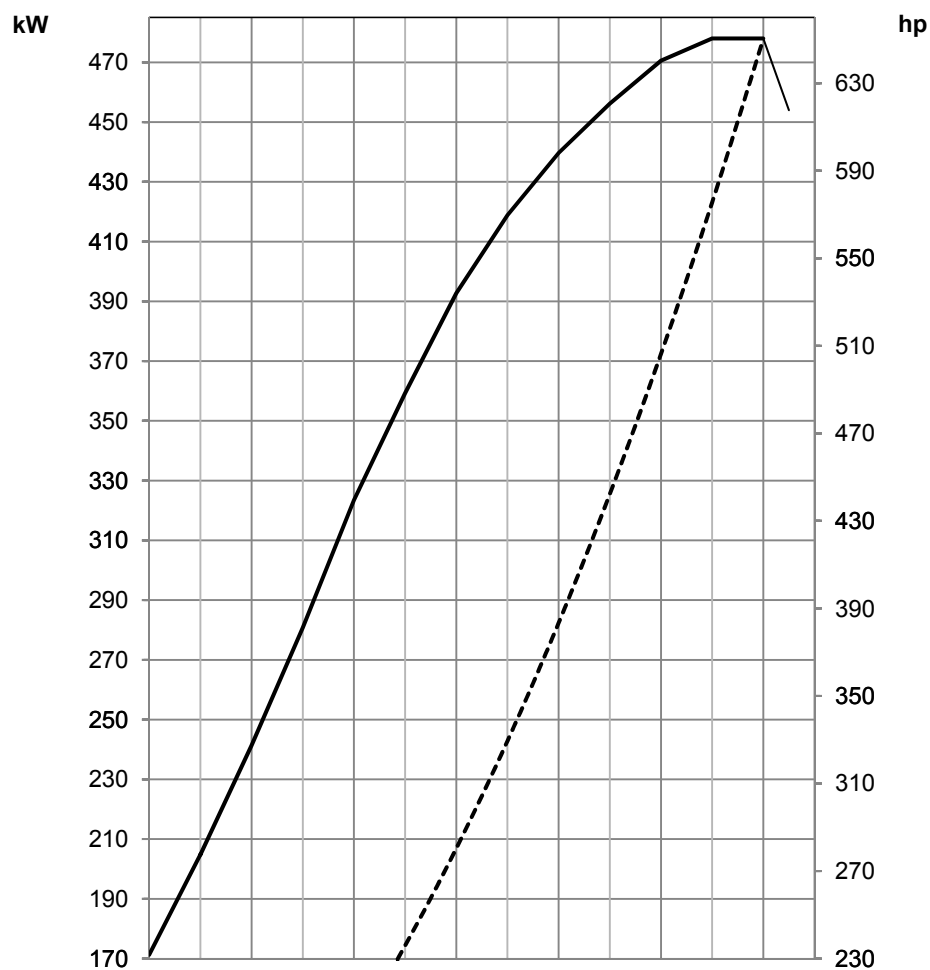
	Engine speed (rpm)					Unit
	1200	1500	1800	2000	2100	
Gross power						
Full load curve	281	393	456	478	478	kW
	382	534	620	650	650	hp
Propeller curve (assumed exponent 2.5)	118	206	325	423	478	kW
	160	280	442	575	650	hp
Gross torque	2234	2500	2420	2282	2174	Nm
Spec. fuel consumption						
full load	195	202	196	201	214	g/kWh
3/4 load	193	202	209	203	215	g/kWh
1/2 load	197	204	213	212	224	g/kWh
Propeller curve (assumed exponent 2.5)	28	50	82	102	122	l/h
Heat rejection						
to coolant	205	291	324	362	405	kW
to exhaust gas	152	242	260	282	313	kW
to surrounding air	13	19	21	23	24	kW
Air consumption	18	30	40	46	51	kg/min
Pressure in intake manifold	0.7	1.3	1.6	1.7	1.9	Bar
Exhaust flow	19	32	41	48	52	kg/min
Exhaust temperature	467	444	379	359	363	°C



DI16 072M, 478 kW / 650 hp - With heat exchanger (engine ref. 03-21)

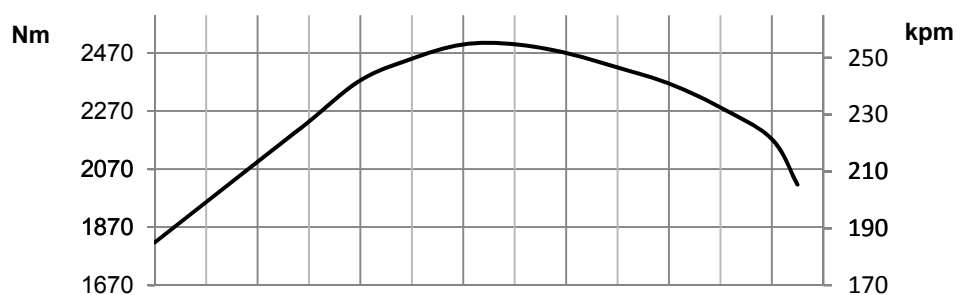
Power

(kW x 1.36 = hp)



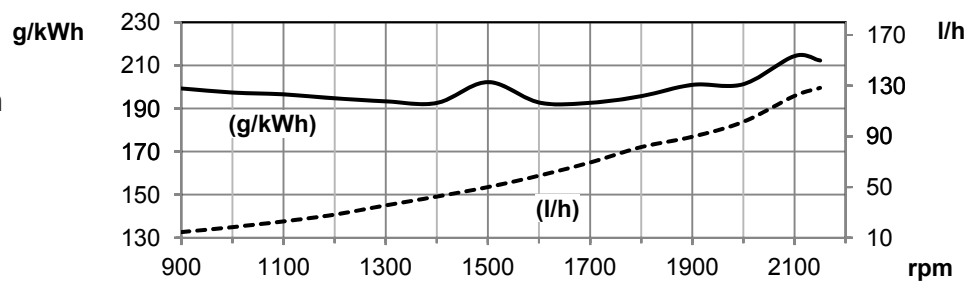
Torque

(Nm / 9.81 = kpm)



Spec. fuel consumption

(g/kWh / 1.36 = g/hph)



----- Propeller curve, assumed exponent 2.5
— Full load curve



Technical data

DI16 072M, 515 kW / 700 hp - With heat exchanger (engine ref. 03-22)

Emission compliance:	Fuel injection system	Rating
EU Stage IIIA, IMO Tier II	PDE	IFN, Intermittent service

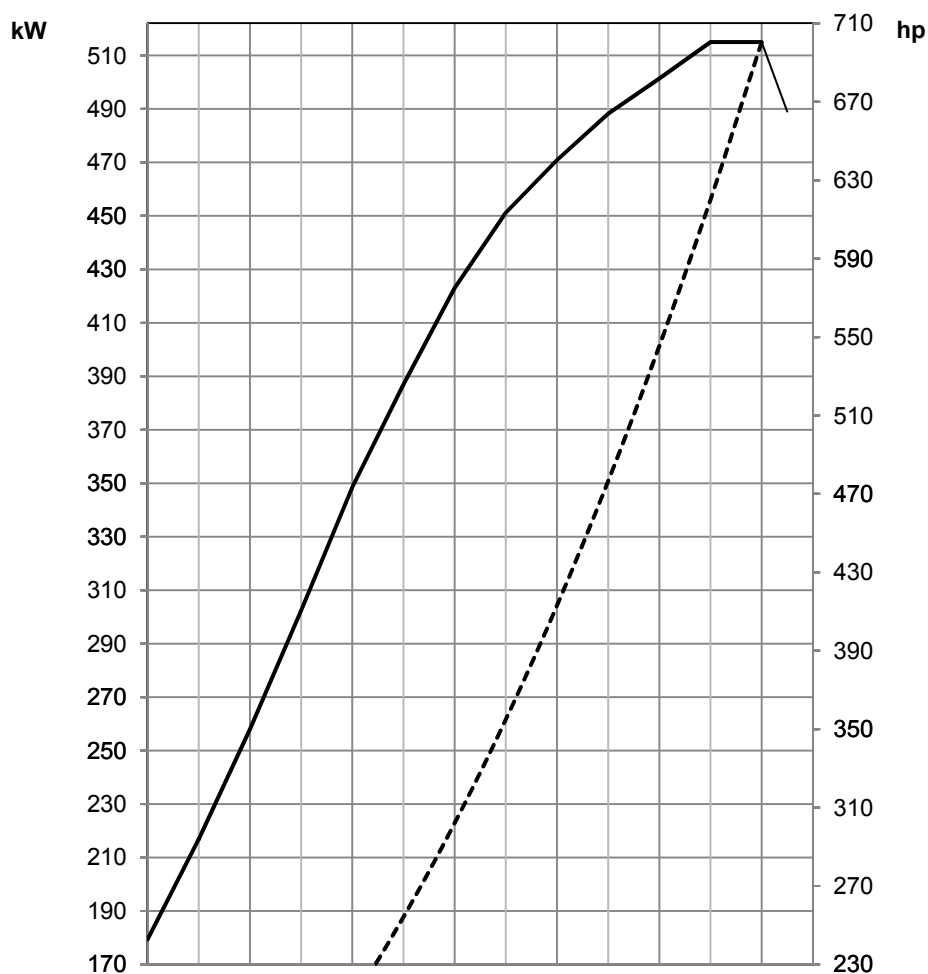
	Engine speed (rpm)					Unit
	1200	1500	1800	2000	2100	
Gross power						
Full load curve	302	423	488	515	515	kW
	411	575	664	700	700	hp
Propeller curve (assumed exponent 2.5)	127	222	350	456	515	kW
	173	302	476	620	700	hp
Gross torque	2406	2693	2590	2459	2342	Nm
Spec. fuel consumption						
full load	195	203	194	202	215	g/kWh
3/4 load	194	201	206	202	215	g/kWh
1/2 load	196	203	213	210	221	g/kWh
Propeller curve (assumed exponent 2.5)	30	54	87	109	132	l/h
Heat rejection						
to coolant	222	317	344	391	437	kW
to exhaust gas	164	261	272	304	339	kW
to surrounding air	14	20	22	24	26	kW
Air consumption	19	32	41	48	52	kg/min
Pressure in intake manifold	0.8	1.5	1.7	1.8	2.0	Bar
Exhaust flow	19	34	42	50	54	kg/min
Exhaust temperature	480	451	383	369	376	°C



DI16 072M, 515 kW / 700 hp - With heat exchanger (engine ref. 03-22)

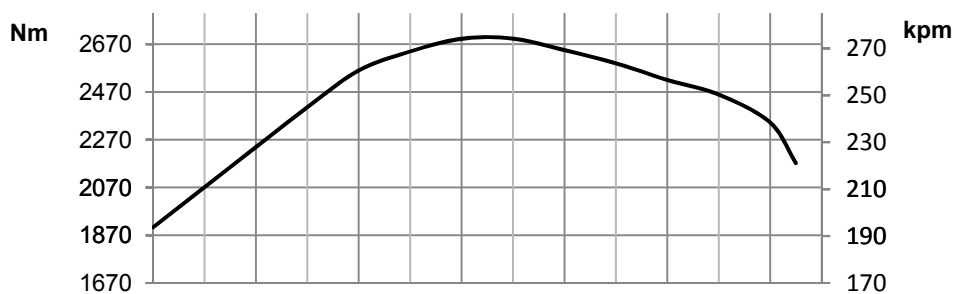
Power

(kW x 1.36 = hp)



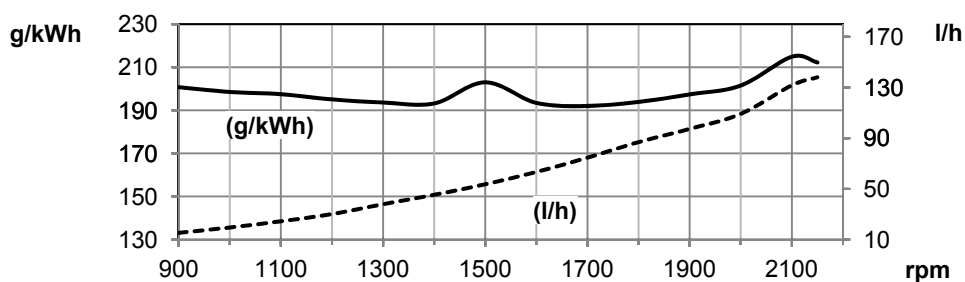
Torque

(Nm / 9.81 = kpm)



Spec. fuel consumption

(g/kWh / 1.36 = g/hph)



----- Propeller curve, assumed exponent 2.5
— Full load curve



Technical data

DI16 072M, 552 kW / 750 hp - With heat exchanger (engine ref. 03-23)

Emission compliance:	Fuel injection system	Rating
EU Stage IIIA, IMO Tier II	PDE	IFN, Intermittent service

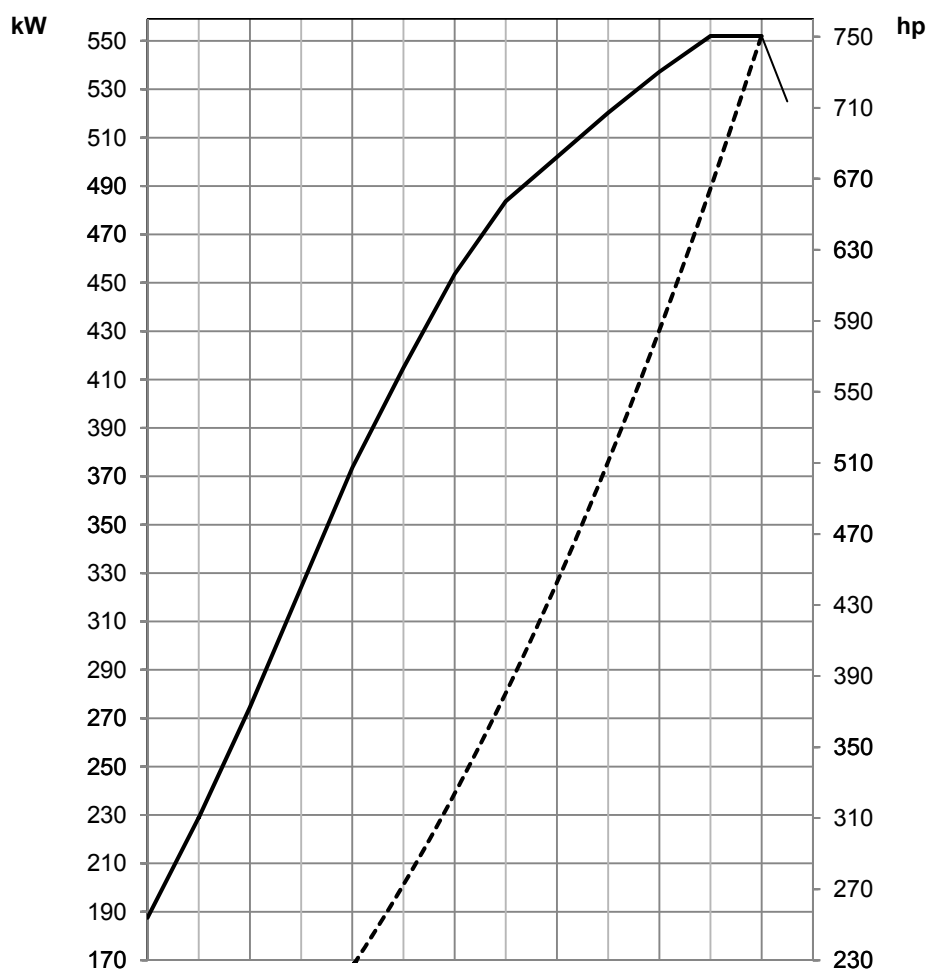
	Engine speed (rpm)					Unit
	1200	1500	1800	2000	2100	
Gross power						
Full load curve	324	453	520	552	552	kW
	441	617	708	750	750	hp
Propeller curve (assumed exponent 2.5)	136	238	375	489	552	kW
	185	324	511	665	750	hp
Gross torque	2579	2887	2760	2636	2510	Nm
Spec. fuel consumption						
full load	196	201	194	202	213	g/kWh
3/4 load	194	201	202	202	215	g/kWh
1/2 load	195	203	212	208	219	g/kWh
Propeller curve (assumed exponent 2.5)	32	57	91	117	140	l/h
Heat rejection						
to coolant	240	335	367	421	462	kW
to exhaust gas	176	275	291	325	359	kW
to surrounding air	15	21	24	26	28	kW
Air consumption	19	33	42	50	54	kg/min
Pressure in intake manifold	0.9	1.6	1.8	2.0	2.1	Bar
Exhaust flow	20	35	44	52	56	kg/min
Exhaust temperature	491	457	392	377	386	°C



DI16 072M, 552 kW / 750 hp - With heat exchanger (engine ref. 03-23)

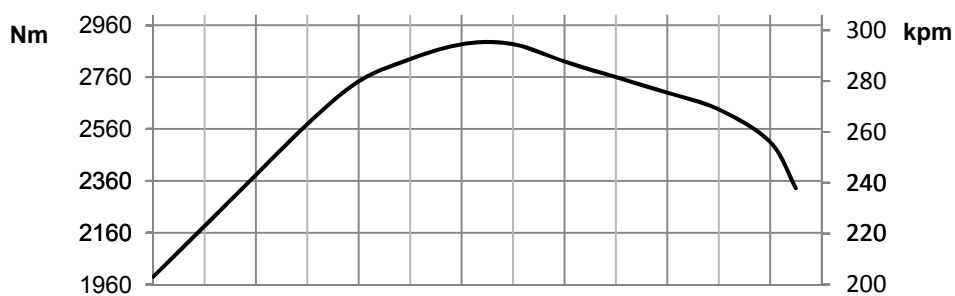
Power

(kW x 1.36 = hp)



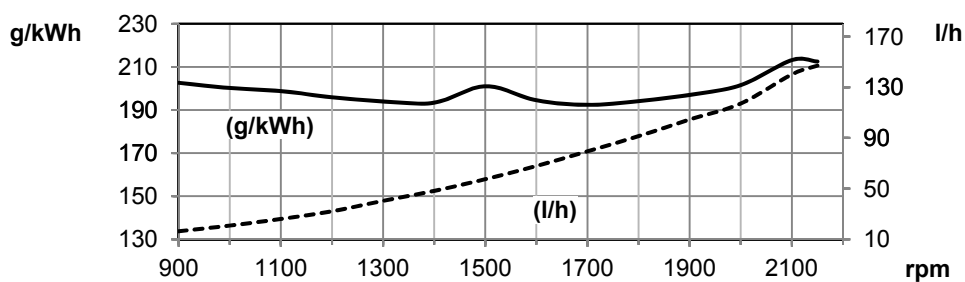
Torque

(Nm / 9.81 = kpm)



Spec. fuel consumption

(g/kWh / 1.36 = g/hph)



----- Propeller curve, assumed exponent 2.5
— Full load curve

6A



Technical data

DI16 072M, 588 kW / 800 hp - With heat exchanger (engine ref. 03-24)

Emission compliance:	Fuel injection system	Rating
EU Stage IIIA, IMO Tier II	PDE	IFN, Intermittent service

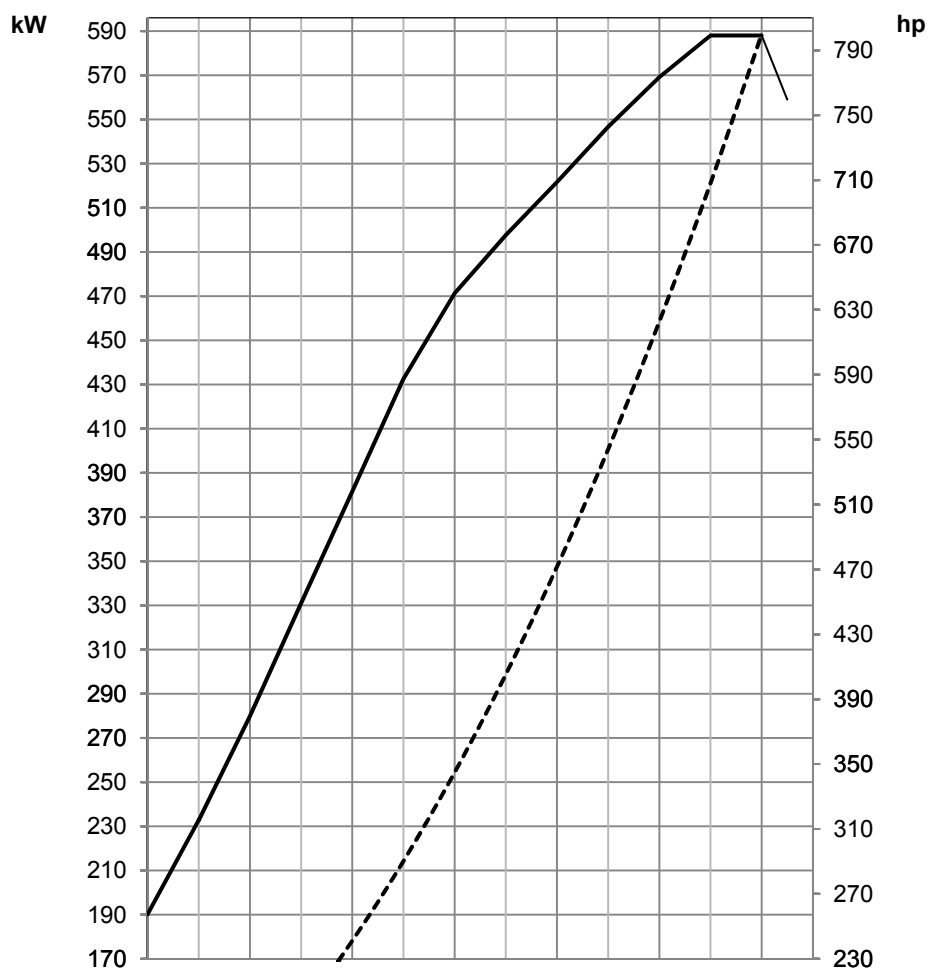
	Engine speed (rpm)					Unit
	1200	1500	1800	2000	2100	
Gross power						
Full load curve	331	471	547	588	588	kW
	450	641	743	800	800	hp
Propeller curve (assumed exponent 2.5)	145	254	400	520	588	kW
	197	345	544	708	800	hp
Gross torque	2634	3000	2900	2807	2674	Nm
Spec. fuel consumption						
full load	196	199	195	202	210	g/kWh
3/4 load	194	201	199	201	215	g/kWh
1/2 load	195	203	212	207	218	g/kWh
Propeller curve (assumed exponent 2.5)	34	61	95	125	147	l/h
Heat rejection						
to coolant	246	343	388	447	482	kW
to exhaust gas	180	280	306	349	369	kW
to surrounding air	15	22	25	28	29	kW
Air consumption	20	34	44	51	54	kg/min
Pressure in intake manifold	0.9	1.6	1.9	2.1	2.1	Bar
Exhaust flow	21	35	46	53	56	kg/min
Exhaust temperature	495	459	398	390	391	°C



DI16 072M, 588 kW / 800 hp - With heat exchanger (engine ref. 03-24)

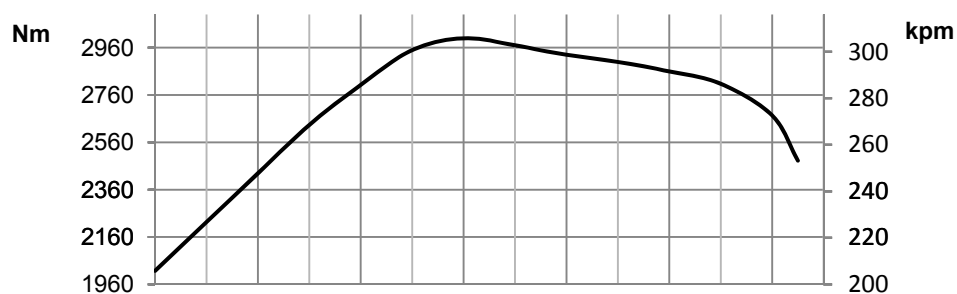
Power

(kW x 1.36 = hp)



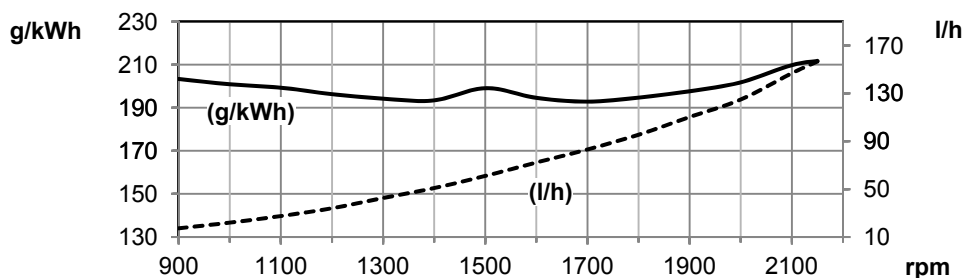
Torque

(Nm / 9.81 = kpm)



Spec. fuel consumption

(g/kWh / 1.36 = g/hph)



----- Propeller curve, assumed exponent 2.5
— Full load curve



Technical data

DI16 072M, 588 kW / 800 hp - With heat exchanger (engine ref. 03-25)

Emission compliance:	Fuel injection system	Rating
EU Stage IIIA, US Tier 2, IMO Tier II	PDE	Patrol craft long

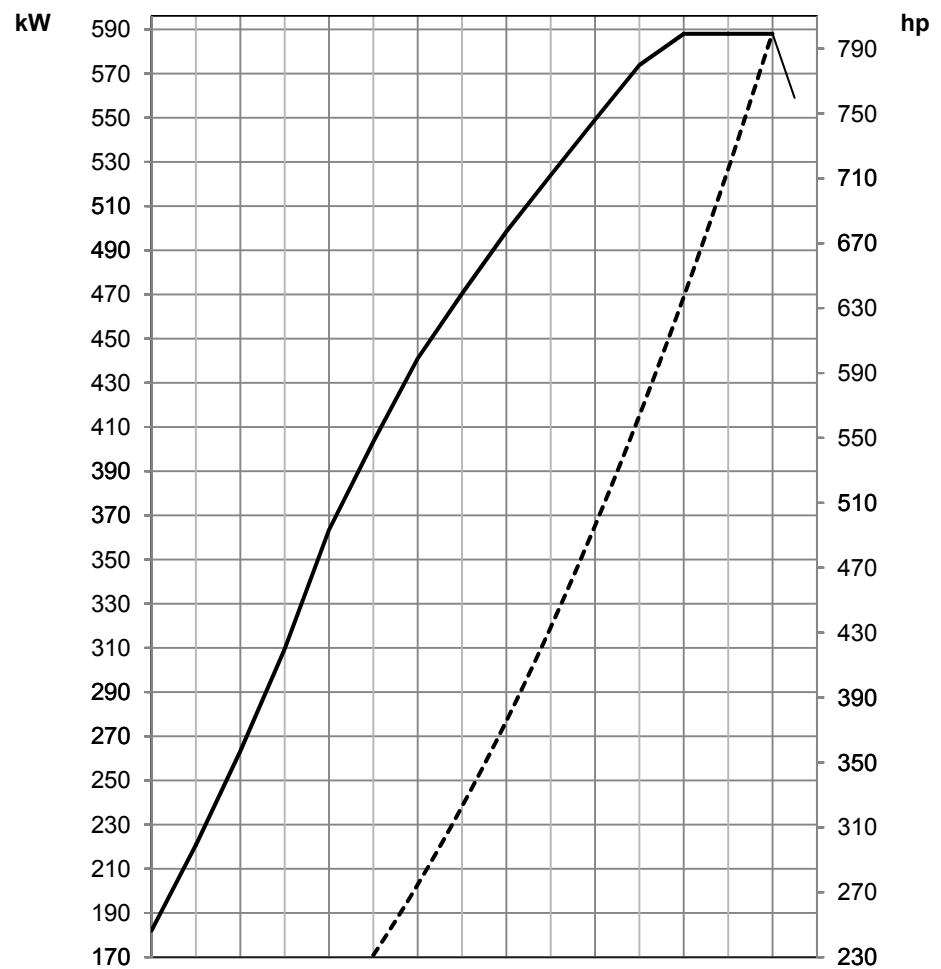
	Engine speed (rpm)						Unit
	1200	1500	1800	2100	2200	2300	
Gross power							
Full load curve	309	441	524	588	588	588	kW
	421	600	713	800	800	800	hp
Propeller curve (assumed exponent 2.5)	116	202	319	468	526	588	kW
	157	275	433	637	716	800	hp
Gross torque	2462	2807	2780	2674	2552	2441	Nm
Spec. fuel consumption							
full load	195	203	194	210	212	218	g/kWh
3/4 load	194	201	201	215	210	221	g/kWh
1/2 load	196	203	212	218	216	233	g/kWh
Propeller curve (assumed exponent 2.5)	28	49	80	119	132	153	l/h
Heat rejection							
to coolant	227	331	370	482	487	518	kW
to exhaust gas	168	271	293	369	376	391	kW
to surrounding air	14	21	24	29	29	30	kW
Air consumption	19	33	43	54	56	58	kg/min
Pressure in intake manifold	0.9	1.6	1.8	2.1	2.1	2.0	Bar
Exhaust flow	20	34	44	56	58	60	kg/min
Exhaust temperature	483	455	393	391	388	391	°C



DI16 072M, 588 kW / 800 hp - With heat exchanger (engine ref. 03-25)

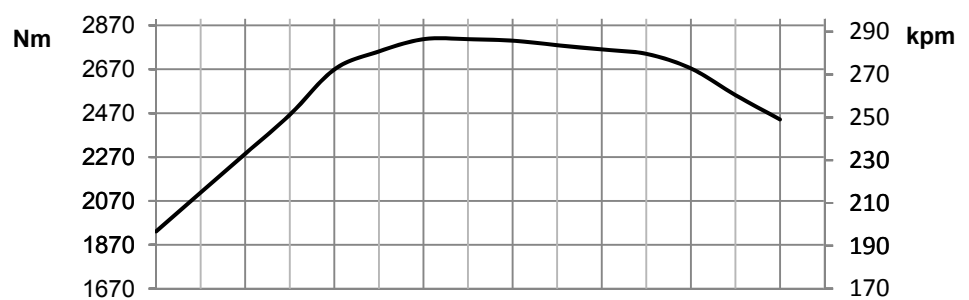
Power

(kW x 1.36 = hp)



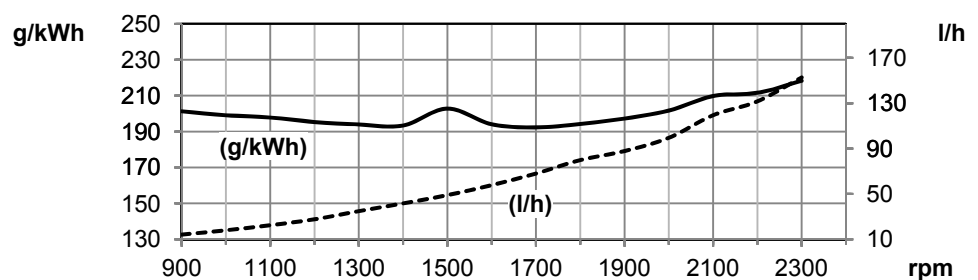
Torque

(Nm / 9.81 = kpm)



Spec. fuel consumption

(g/kWh / 1.36 = g/hph)



----- Propeller curve, assumed exponent 2.5
— Full load curve



Technical data

DI16 072M, 625 kW / 850 hp - With heat exchanger (engine ref. 03-26)

Emission compliance:	Fuel injection system	Rating
EU Stage IIIA, US Tier 2, IMO Tier II	PDE	Patrol craft long

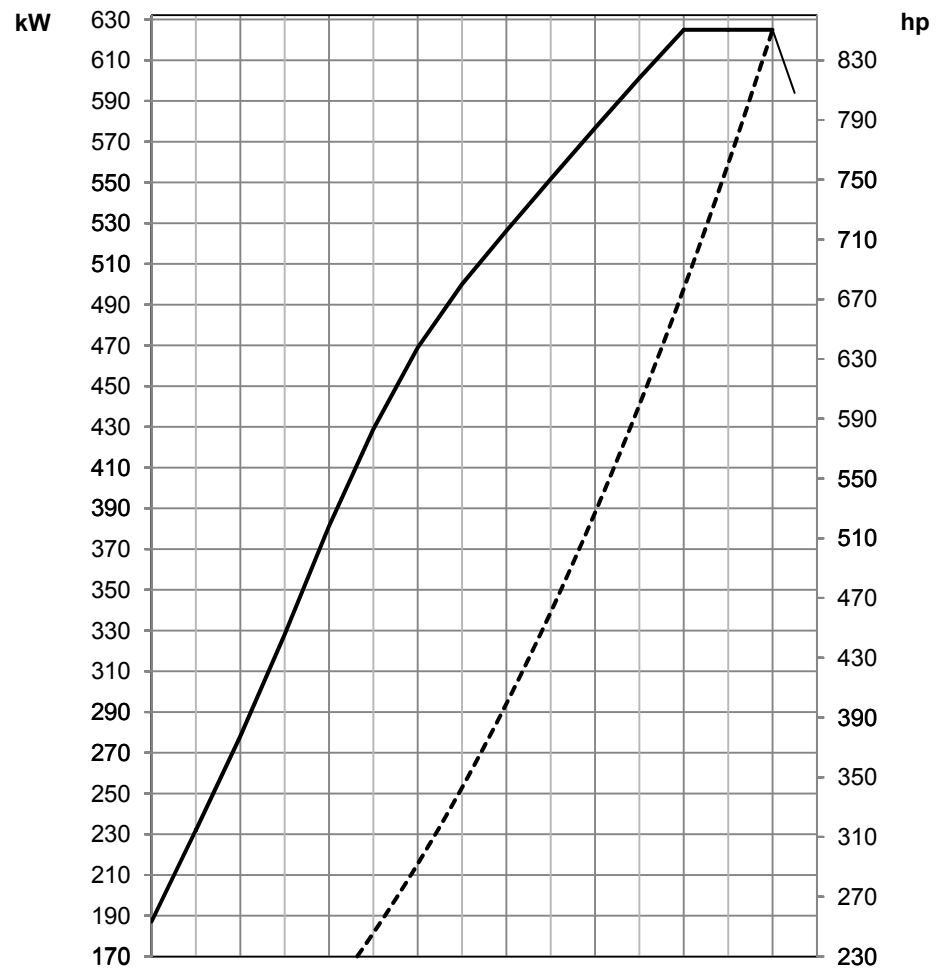
	Engine speed (rpm)						Unit
	1200	1500	1800	2100	2200	2300	
Gross power							
Full load curve	328	469	552	625	625	625	kW
	446	637	750	850	850	850	hp
Propeller curve (assumed exponent 2.5)	123	215	339	498	559	625	kW
	167	292	461	677	761	850	hp
Gross torque	2610	2984	2927	2842	2713	2595	Nm
Spec. fuel consumption							
full load	196	199	195	208	212	219	g/kWh
3/4 load	194	201	199	214	210	221	g/kWh
1/2 load	195	203	212	217	214	230	g/kWh
Propeller curve (assumed exponent 2.5)	29	52	85	127	140	163	l/h
Heat rejection							
to coolant	244	341	392	505	521	551	kW
to exhaust gas	179	279	310	388	400	422	kW
to surrounding air	15	22	25	31	31	32	kW
Air consumption	19	34	44	55	57	59	kg/min
Pressure in intake manifold	0.9	1.6	1.9	2.2	2.1	2.1	Bar
Exhaust flow	21	35	46	57	59	61	kg/min
Exhaust temperature	493	458	399	401	401	409	°C



DI16 072M, 625 kW / 850 hp - With heat exchanger (engine ref. 03-26)

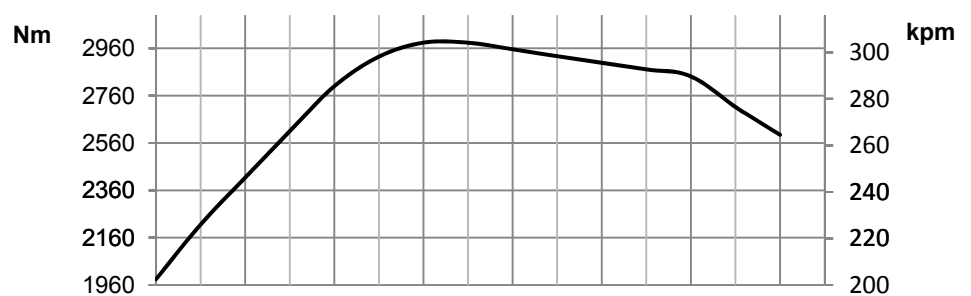
Power

(kW x 1.36 = hp)



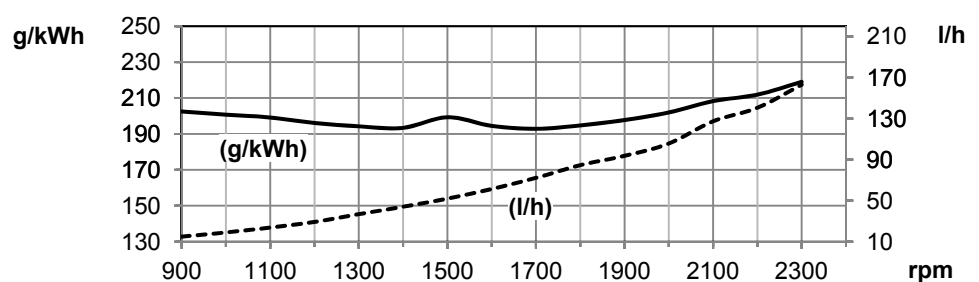
Torque

(Nm / 9.81 = kpm)



Spec. fuel consumption

(g/kWh / 1.36 = g/hph)



----- Propeller curve, assumed exponent 2.5
— Full load curve



Technical data

DI16 072M, 662 kW / 900 hp - With heat exchanger (engine ref. 03-27)

Emission compliance:	Fuel injection system	Rating
EU Stage IIIA, US Tier 2, IMO Tier II	PDE	Patrol craft short

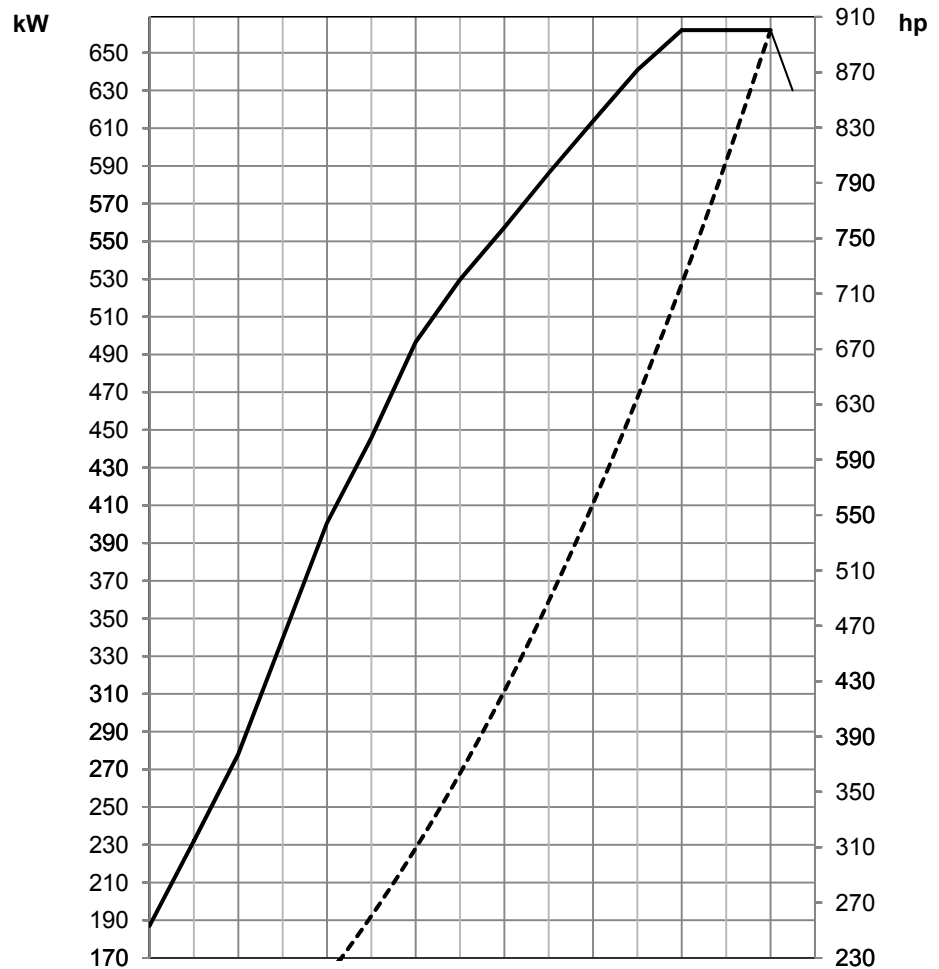
	Engine speed (rpm)						Unit
	1200	1500	1800	2100	2200	2300	
Gross power							
Full load curve	339	497	586	662	662	662	kW
	461	675	797	900	900	900	hp
Propeller curve (assumed exponent 2.5)	130	227	359	527	592	662	kW
	177	309	488	717	806	900	hp
Gross torque	2700	3161	3110	3010	2873	2749	Nm
Spec. fuel consumption							
full load	197	197	195	208	213	220	g/kWh
3/4 load	194	202	197	215	210	220	g/kWh
1/2 load	195	202	211	216	213	228	g/kWh
Propeller curve (assumed exponent 2.5)	31	55	89	135	149	173	l/h
Heat rejection							
to coolant	254	356	418	531	553	588	kW
to exhaust gas	185	287	330	414	427	451	kW
to surrounding air	16	23	27	32	33	34	kW
Air consumption	20	34	46	56	58	60	kg/min
Pressure in intake manifold	1.0	1.7	2.0	2.3	2.2	2.2	Bar
Exhaust flow	21	36	48	59	60	62	kg/min
Exhaust temperature	499	461	407	416	416	425	°C



DI16 072M, 662 kW / 900 hp - With heat exchanger (engine ref. 03-27)

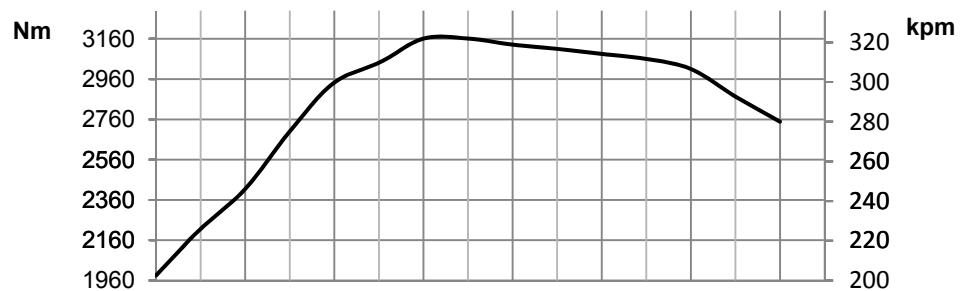
Power

(kW x 1.36 = hp)



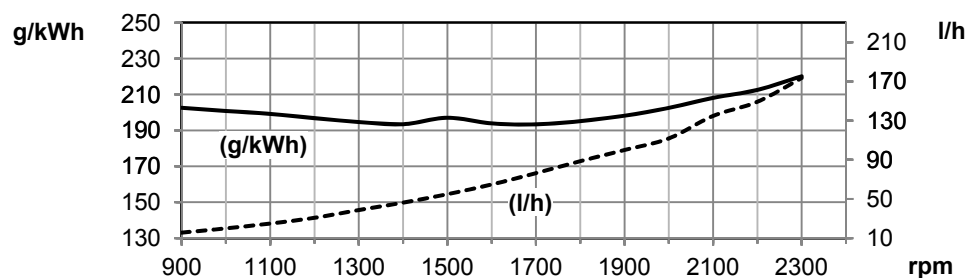
Torque

(Nm / 9.81 = kpm)



Spec. fuel consumption

(g/kWh / 1.36 = g/hph)



----- Propeller curve, assumed exponent 2.5
—— Full load curve



Technical data

DI16 077M, 662 kW / 900 hp - With heat exchanger (engine ref. 03-41)

Emission compliance	Fuel injection system	Rating
EU Stage IIIA, US Tier 2, IMO Tier II	PDE	Patrol craft long <u>Note!</u> Optimized for Water Jet applications. Not intended for conventional propeller use.

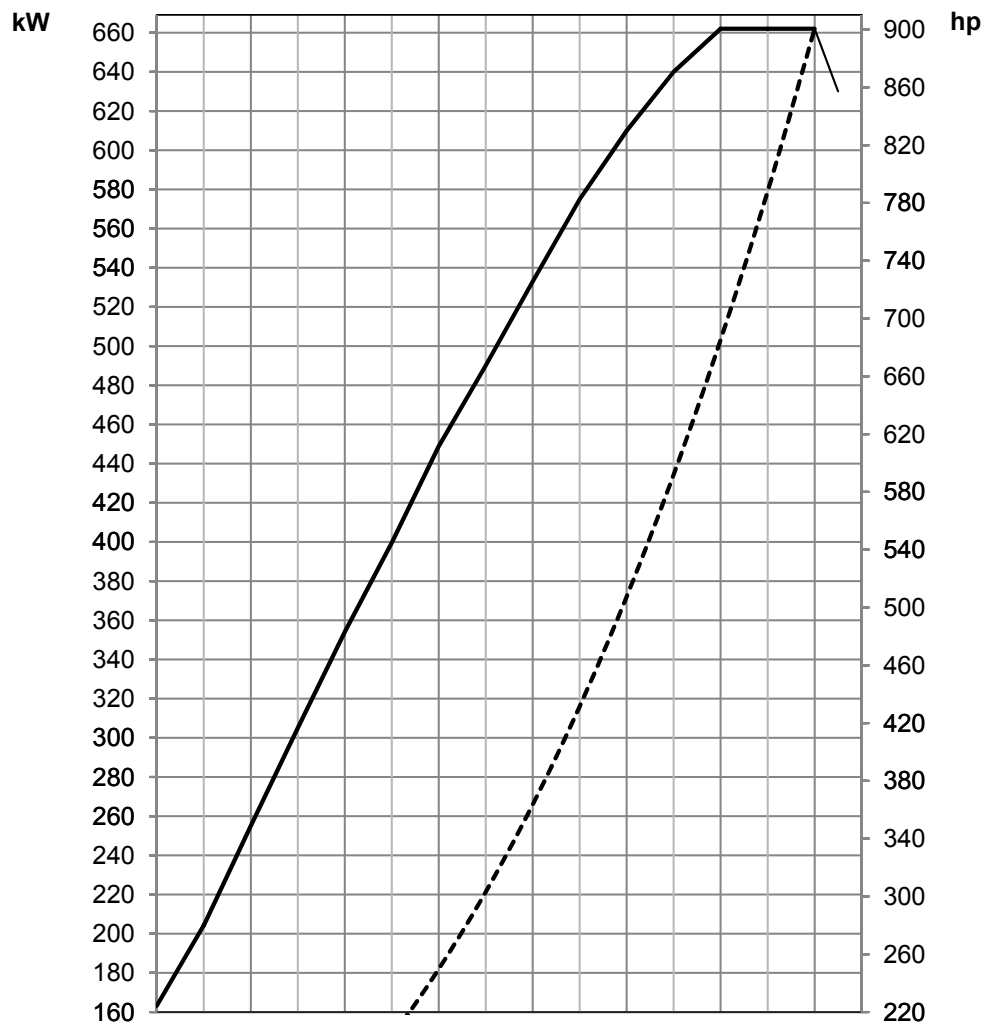
	Engine speed (rpm)						Unit
	1200	1500	1800	2100	2200	2300	
Gross power							
Full load curve	305	449	575	662	662	662	kW
	415	610	782	900	900	900	hp
Propeller curve (assumed exponent 3.0)	94	184	317	504	579	662	kW
	128	250	432	685	788	900	hp
Gross torque	2427	2857	3050	3010	2873	2749	Nm
Spec. fuel consumption							
full load	204	200	202	216	219	224	g/kWh
3/4 load	199	199	204	213	211	215	g/kWh
1/2 load	200	207	210	212	213	223	g/kWh
Propeller curve (assumed exponent 3.0)	23	47	78	128	147	177	l/h
Heat rejection							
to coolant	244	328	424	566	574	597	kW
to exhaust gas	177	268	353	442	454	474	kW
to surrounding air	15	21	27	34	34	35	kW
Air consumption	18	29	43	55	57	59	kg/min
Pressure in intake manifold	0.7	1.2	1.7	2.1	2.1	2.0	Bar
Exhaust flow	18	30	44	57	59	61	kg/min
Exhaust temperature	524	502	457	445	443	448	°C



DI16 077M, 662 kW / 900 hp - With heat exchanger (engine ref. 03-41)

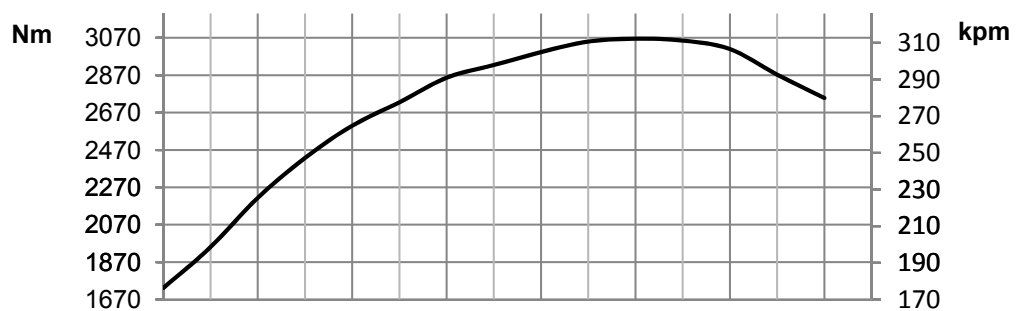
Power

(kW x 1.36 = hp)



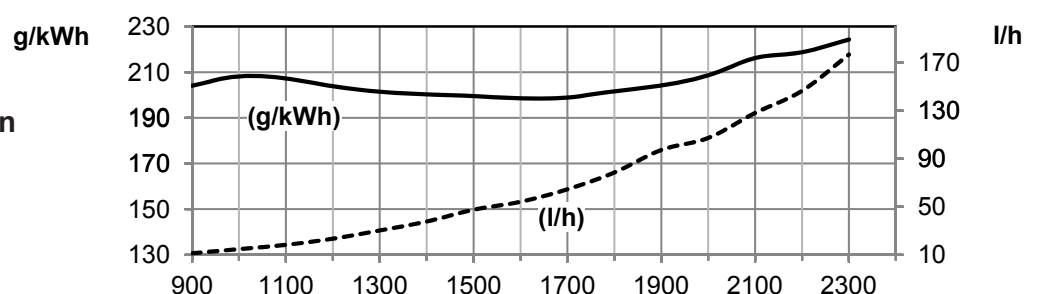
Torque

(Nm / 9.81 = kpm)



Spec. fuel consumption

(g/kWh / 1.36 = g/hph)



----- Propeller curve, assumed exponent 3.0
—— Full load curve



Technical data

DI16 077M, 736 kW / 1000 hp - With heat exchanger (engine ref. 03-42)

Emission compliance	Fuel injection system	Rating
EU Stage IIIA, US Tier 2, IMO Tier II	PDE	Patrol craft short <u>Note!</u> Optimized for Water Jet applications. Not intended for conventional propeller use.

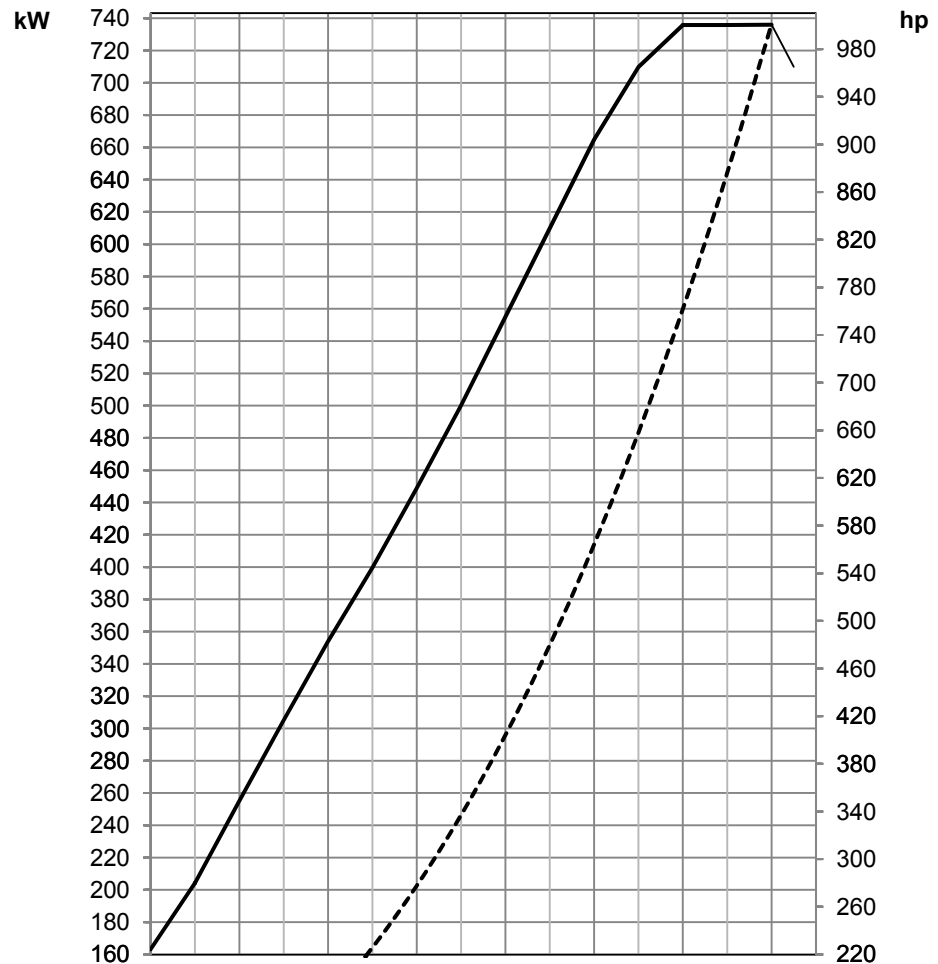
	Engine speed (rpm)						Unit
	1200	1500	1800	2100	2200	2300	
Gross power							
Full load curve	305	449	610	736	736	736	kW
	415	610	830	1000	1000	1000	hp
Propeller curve (assumed exponent 3.0)	105	204	353	560	644	736	kW
	142	278	480	762	876	1000	hp
Gross torque	2427	2857	3236	3346	3194	3056	Nm
Spec. fuel consumption							
full load	204	200	200	218	221	228	g/kWh
3/4 load	199	199	203	212	212	218	g/kWh
1/2 load	200	207	208	211	212	220	g/kWh
Propeller curve (assumed exponent 3.0)	25	52	90	141	167	200	l/h
Heat rejection							
to coolant	244	328	437	627	638	676	kW
to exhaust gas	177	268	374	507	520	549	kW
to surrounding air	15	21	29	38	38	40	kW
Air consumption	18	29	45	58	60	62	kg/min
Pressure in intake manifold	0.7	1.2	1.8	2.3	2.3	2.2	Bar
Exhaust flow	18	30	46	60	62	63	kg/min
Exhaust temperature	524	502	463	477	477	489	°C



DI16 077M, 736 kW / 1000 hp - With heat exchanger (engine ref. 03-42)

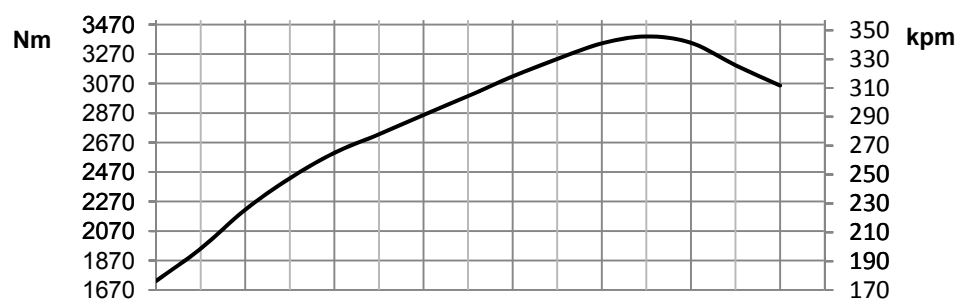
Power

(kW x 1.36 = hp)



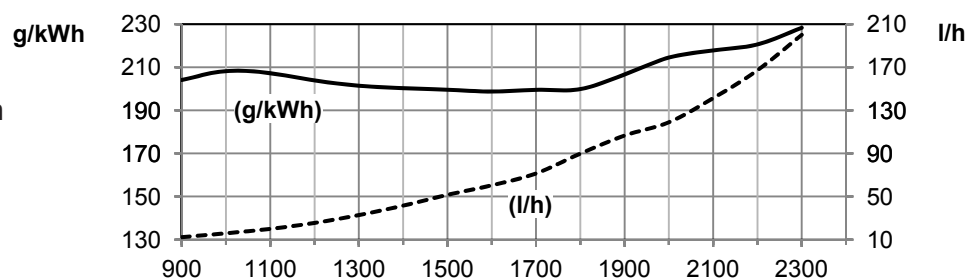
Torque

(Nm / 9.81 = kpm)



Spec. fuel consumption

(g/kWh / 1.36 = g/hph)



----- Propeller curve, assumed exponent 3.0
—— Full load curve



Technical data

DI16 071M, 405 kW / 550 hp - With keel cooling, single circuit (engine ref. 03-11)

Emission compliance	Fuel injection system	Rating
EU Stage IIIA, US Tier 2, IMO Tier II	PDE	ICFN, Continuous service

	Engine speed (rpm)				Unit
	1200	1500	1700	1800	
Gross power					
Full load curve	300	385	405	405	kW
	408	524	550	550	hp
Propeller curve (assumed exponent 2.5)	147	257	351	405	kW
	200	349	477	550	hp
Gross torque	2387	2451	2275	2149	Nm
Spec. fuel consumption					
full load	206	209	207	213	g/kWh
3/4 load	204	218	212	227	g/kWh
1/2 load	209	223	214	233	g/kWh
Propeller curve (assumed exponent 2.5)	37	67	87	103	l/h
Heat rejection					
to coolant*	240	301	306	323	kW
to exhaust gas	182	256	268	279	kW
to surrounding air	15	19	20	20	kW
Air consumption	18	27	32	36	kg/min
Air temperature					
before charge air cooler	118	148	153	160	°C
after charge air cooler	71	76	78	79	°C
Pressure in intake manifold	0.9	1.4	1.5	1.6	Bar
Exhaust flow	19	29	34	37	kg/min
Exhaust temperature	541	506	459	441	°C

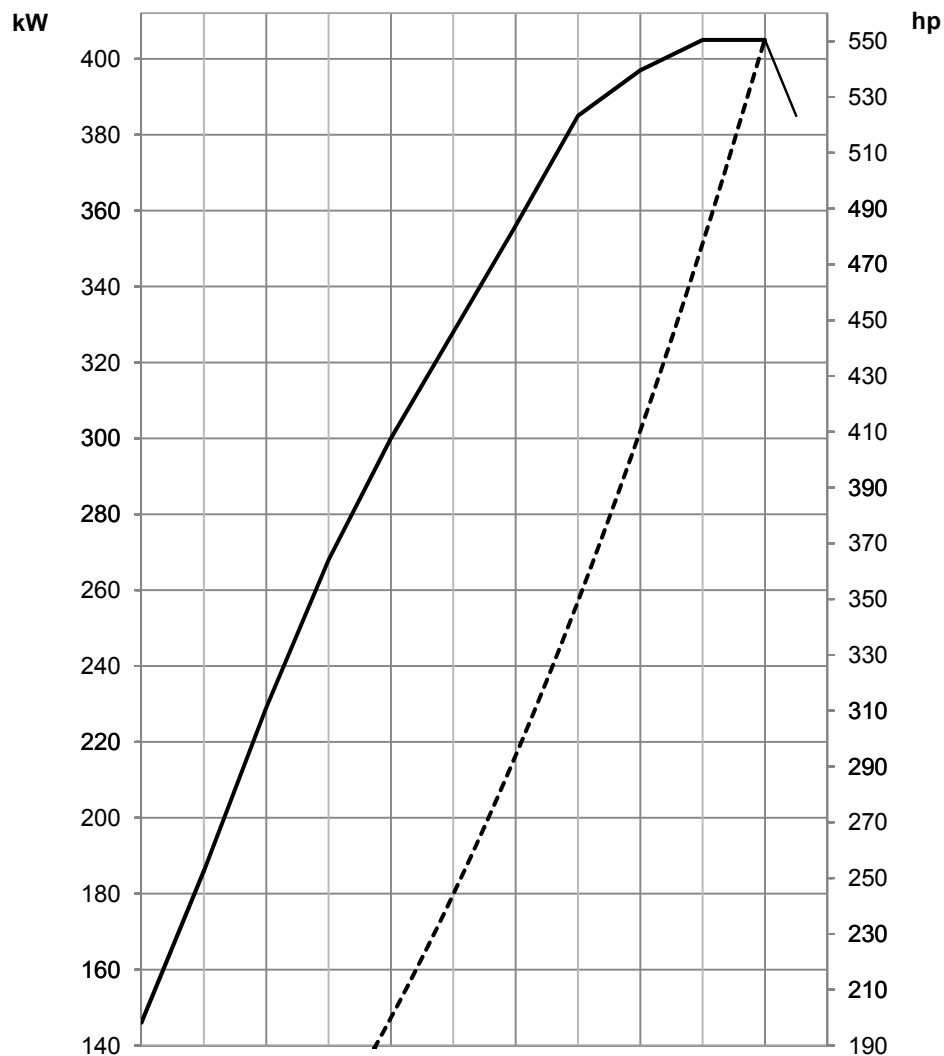
*Including charge air



DI16 071M, 405 kW / 550 hp - With keel cooling, single circuit (engine ref. 03-11)

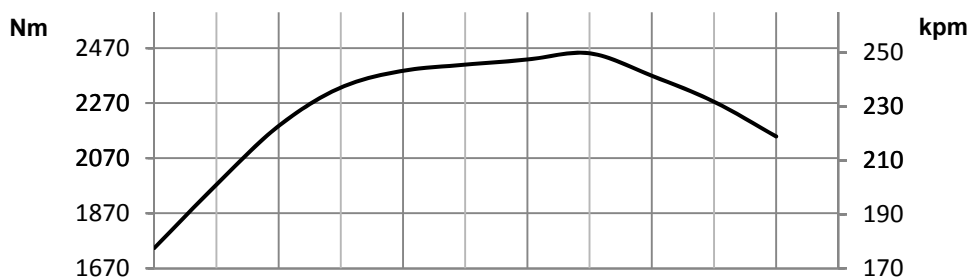
Power

(kW x 1.36 = hp)



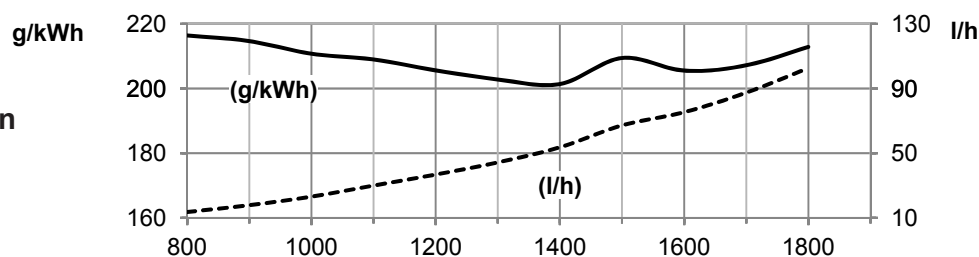
Torque

(Nm / 9.81 = kpm)



Spec. fuel consumption

(g/kWh / 1.36 = g/hph)



----- Propeller curve, assumed exponent 2.5
— Full load curve



Technical data

DI16 071M, 460 kW / 625 hp - With keel cooling, single circuit (engine ref. 03-12)

Emission compliance	Fuel injection system	Rating
EU Stage IIIA, US Tier 2, IMO Tier II	PDE	ICFN, Continuous service

	Engine speed (rpm)				Unit
	1200	1500	1700	1800	
Gross power					
Full load curve	325	437	460	460	kW
	442	594	625	625	hp
Propeller curve (assumed exponent 2.5)	167	292	399	460	kW
	227	397	542	625	hp
Gross torque	2586	2782	2584	2440	Nm
Spec. fuel consumption					
full load	207	209	206	212	g/kWh
3/4 load	204	215	210	222	g/kWh
1/2 load	206	222	215	234	g/kWh
Propeller curve (assumed exponent 2.5)	41	76	98	116	l/h
Heat rejection					
to coolant*	266	341	350	366	kW
to exhaust gas	195	288	300	313	kW
to surrounding air	16	22	22	23	kW
Air consumption	19	30	35	38	kg/min
Air temperature					
before charge air cooler	126	163	168	174	°C
after charge air cooler	71	78	80	82	°C
Pressure in intake manifold	1.0	1.6	1.7	1.8	Bar
Exhaust flow	20	32	37	40	kg/min
Exhaust temperature	547	516	471	455	°C

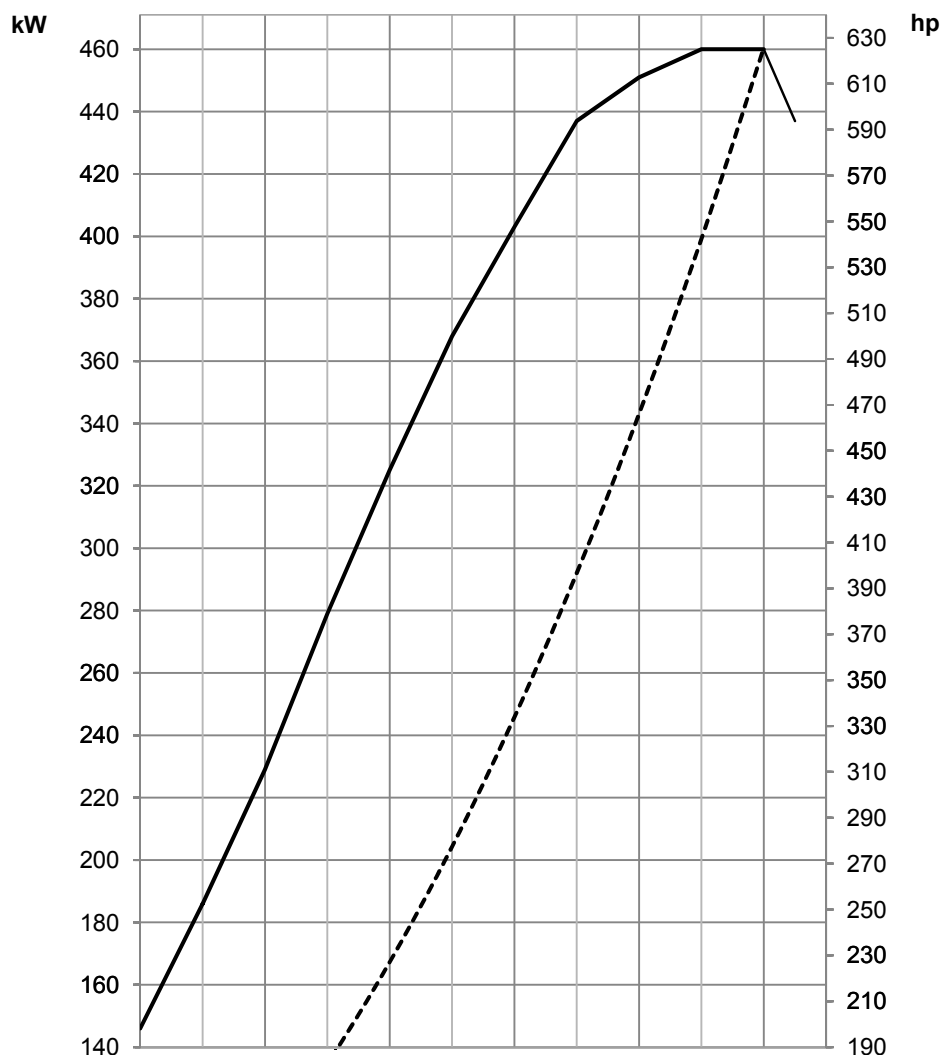
*Including charge air



DI16 071M, 460 kW / 625 hp- With keel cooling, single circuit (engine ref. 03-12)

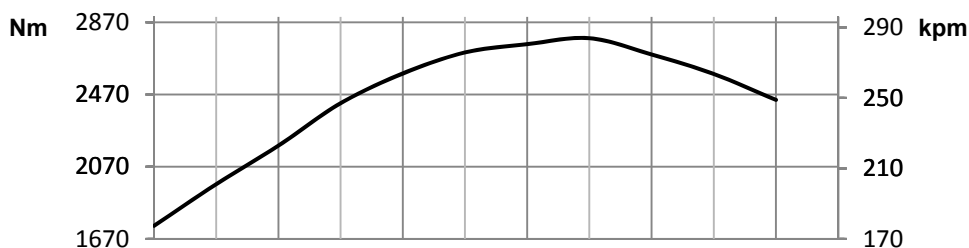
Power

(kW x 1.36 = hp)



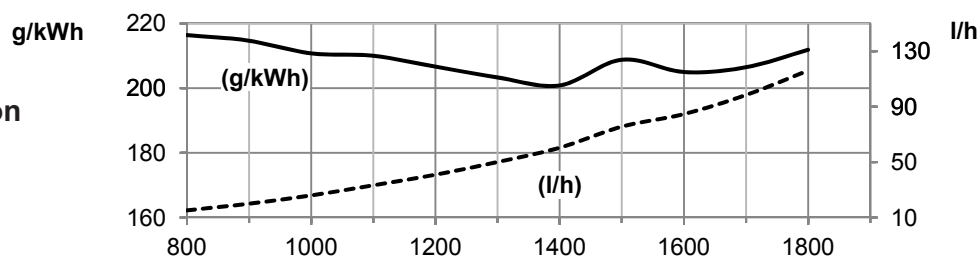
Torque

(Nm / 9.81 = kpm)



Spec. fuel consumption

(g/kWh / 1.36 = g/hph)



----- Propeller curve, assumed exponent 2.5
—— Full load curve



Technical data

DI16 073M, 478 kW / 650 hp - With keel cooling, double circuit (engine ref. 03-31)

Emission compliance:	Fuel injection system	Rating
EU Stage IIIA, IMO Tier II	PDE	IFN, Intermittent service

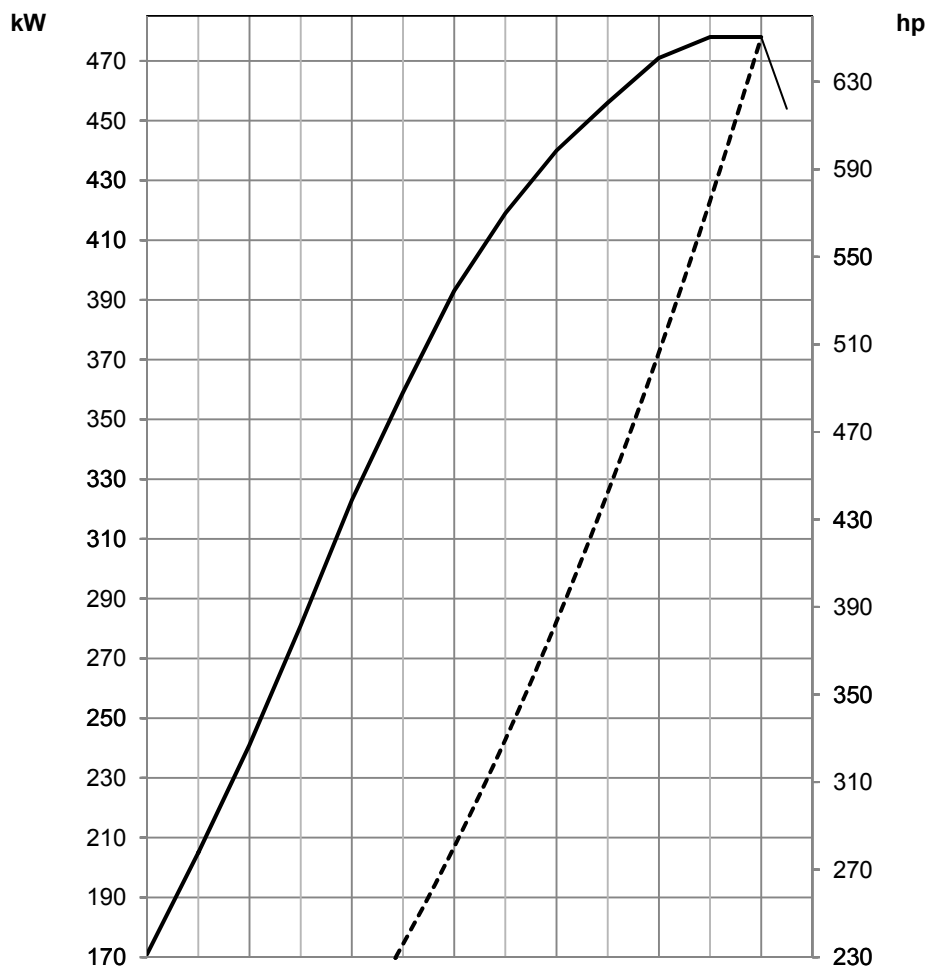
	Engine speed (rpm)					Unit
	1200	1500	1800	2000	2100	
Gross power						
Full load curve	281	393	456	478	478	kW
	382	534	620	650	650	hp
Propeller curve (assumed exponent 2.5)	118	206	325	423	478	kW
	160	280	442	575	650	hp
Gross torque	2236	2502	2419	2282	2174	Nm
Spec. fuel consumption						
full load	197	209	201	208	214	g/kWh
3/4 load	196	211	205	212	230	g/kWh
1/2 load	203	212	211	220	239	g/kWh
Propeller curve (assumed exponent 2.5)	29	52	80	106	122	l/h
Heat rejection						
to main coolant circuit	194	264	278	302	313	kW
to exhaust gas	159	260	277	309	323	kW
to surrounding air	13	20	22	24	24	kW
to charge air cooler circuit	17	52	68	86	93	kW
Coolant flow @ back pressure in water circuit for charge air cooler	169@0.06	202@0.08	205@0.08	200@0.08	200@0.08	dm ³ @bar
Max. water inlet temp. to charge air cooler	40	40	40	40	40	°C
Air consumption	18	31	39	46	49	kg/min
Air temperature						
before charge air cooler	104	157	164	179	184	°C
after charge air cooler	44	54	59	66	68	°C
Pressure in intake manifold	0.7	1.5	1.6	1.8	1.9	Bar
Exhaust flow	18	32	40	48	50	kg/min
Exhaust temperature	489	467	405	388	385	°C



DI16 073M, 478 kW / 650 hp - With keel cooling, double circuit (engine ref. 03-31)

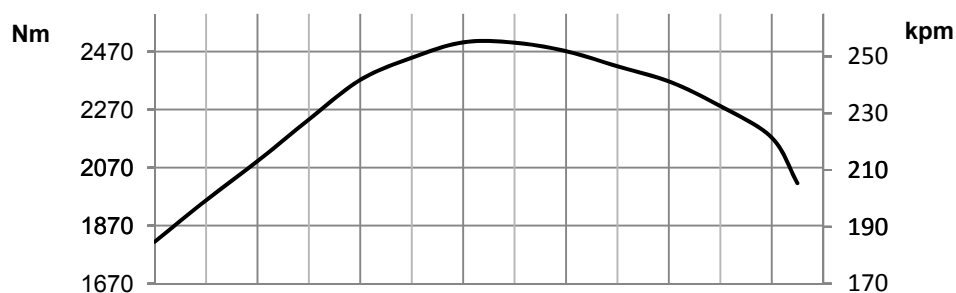
Power

(kW x 1.36 = hp)



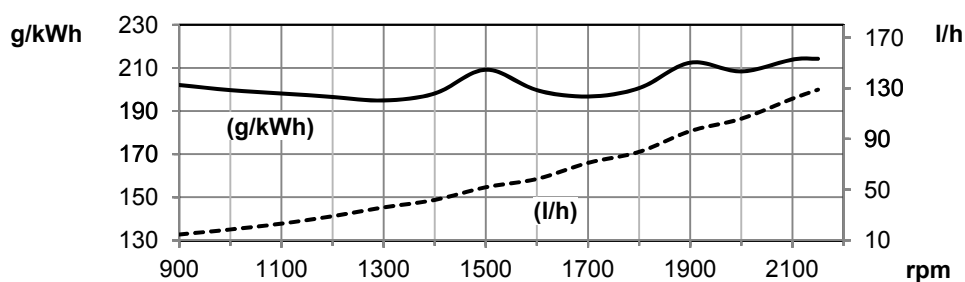
Torque

(Nm / 9.81 = kpm)



Spec. fuel consumption

(g/kWh / 1.36 = g/hph)



----- Propeller curve, assumed exponent 2.5
— Full load curve



Technical data

DI16 073M, 515 kW / 700 hp - With keel cooling, double circuit (engine ref. 03-32)

Emission compliance:	Fuel injection system	Rating
EU Stage IIIA, IMO Tier II	PDE	IFN, Intermittent service

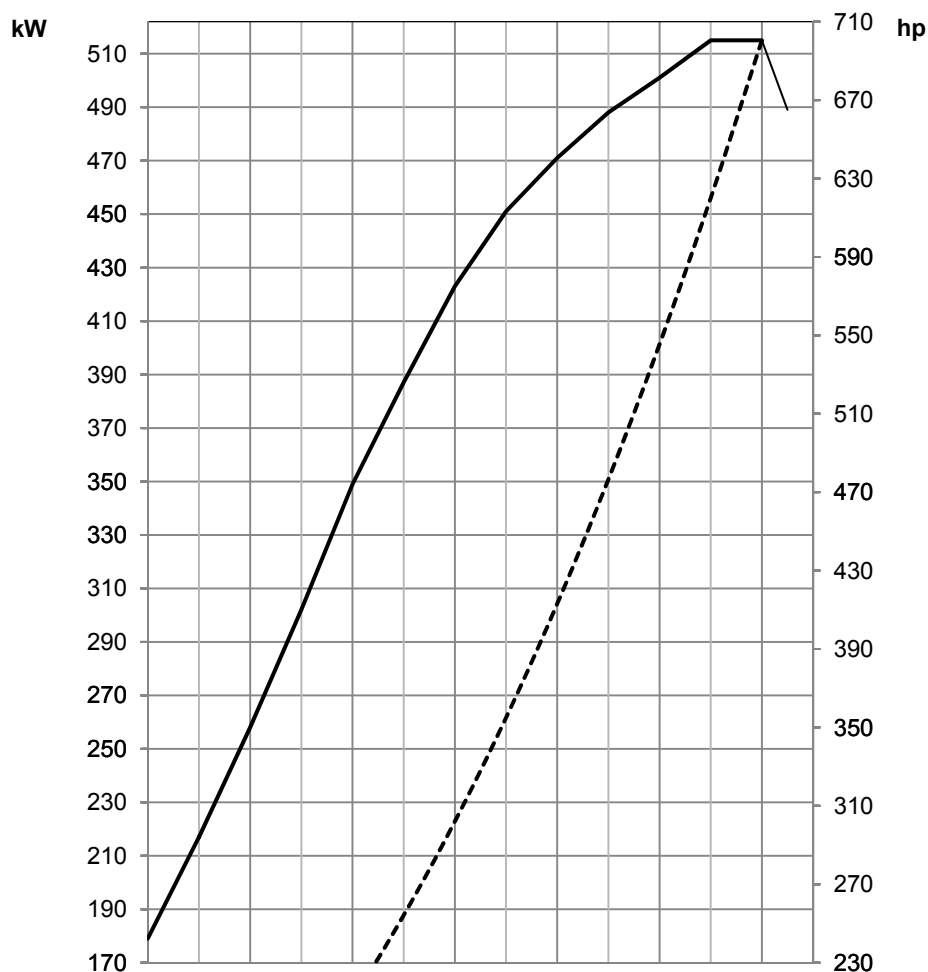
	Engine speed (rpm)					Unit
	1200	1500	1800	2000	2100	
Gross power						
Full load curve	302	423	488	515	515	kW
	411	575	664	700	700	hp
Propeller curve (assumed exponent 2.5)	127	222	350	456	515	kW
	173	302	476	620	700	hp
Gross torque	2403	2693	2589	2459	2342	Nm
Spec. fuel consumption						
full load	197	208	200	208	214	g/kWh
3/4 load	195	212	204	212	228	g/kWh
1/2 load	201	211	210	218	237	g/kWh
Propeller curve (assumed exponent 2.5)	31	56	85	114	131	l/h
Heat rejection						
to main coolant circuit	210	280	294	323	335	kW
to exhaust gas	172	276	295	334	348	kW
to surrounding air	14	21	23	26	26	kW
to charge air cooler circuit	20	58	74	94	101	kW
Coolant flow @ back pressure in water circuit for charge air cooler	169@0.06	202@0.08	205@0.08	200@0.08	200@0.08	dm ³ @bar
Max. water inlet temp. to charge air cooler	40	40	40	40	40	°C
Air consumption	18	32	40	48	50	kg/min
Air temperature						
before charge air cooler	112	165	171	188	192	°C
after charge air cooler	45	56	61	68	71	°C
Pressure in intake manifold	0.8	1.6	1.7	2.0	2.0	Bar
Exhaust flow	19	34	42	50	52	kg/min
Exhaust temperature	503	473	414	401	397	°C



DI16 073M, 515 kW / 700 hp - With keel cooling, double circuit (engine ref. 03-32)

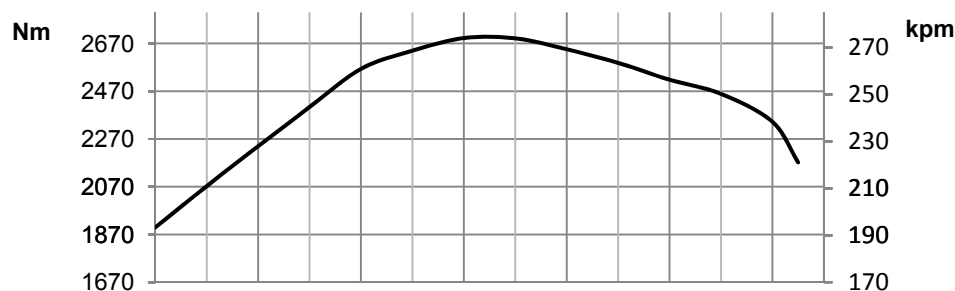
Power

(kW x 1.36 = hp)



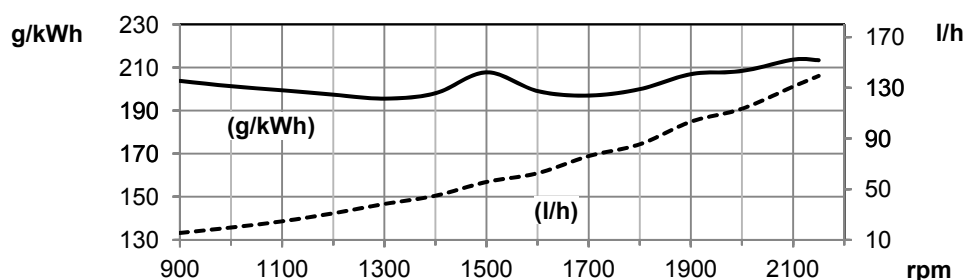
Torque

(Nm / 9.81 = kpm)



Spec. fuel consumption

(g/kWh / 1.36 = g/hph)



----- Propeller curve, assumed exponent 2.5
—— Full load curve



Technical data

DI16 073M, 552 kW / 750 hp - With keel cooling, double circuit (engine ref. 03-33)

Emission compliance:	Fuel injection system	Rating
EU Stage IIIA, IMO Tier II	PDE	IFN, Intermittent service

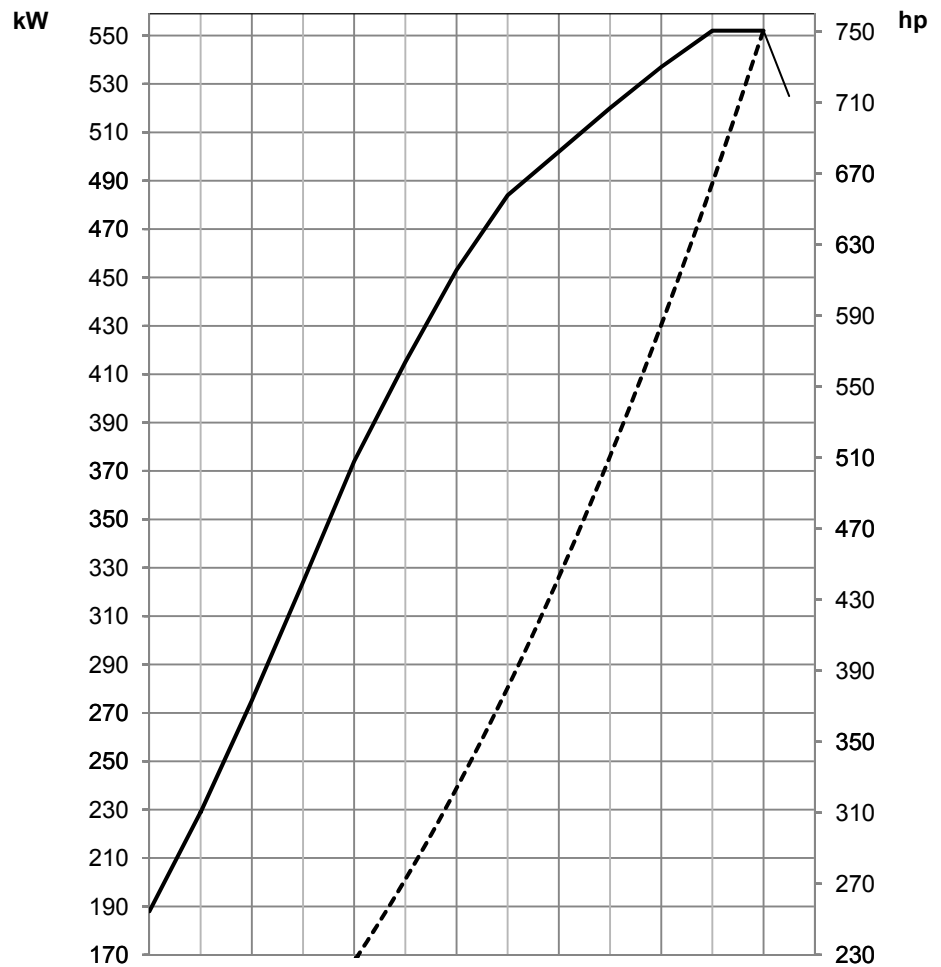
	Engine speed (rpm)					Unit
	1200	1500	1800	2000	2100	
Gross power						
Full load curve	324	453	520	552	552	kW
	441	616	707	750	750	hp
Propeller curve (assumed exponent 2.5)	136	238	375	489	552	kW
	185	324	511	665	750	hp
Gross torque	2578	2884	2759	2636	2510	Nm
Spec. fuel consumption						
full load	199	206	201	209	214	g/kWh
3/4 load	195	212	203	211	227	g/kWh
1/2 load	200	211	208	217	236	g/kWh
Propeller curve (assumed exponent 2.5)	33	60	91	121	141	l/h
Heat rejection						
to main coolant circuit	227	295	312	343	357	kW
to exhaust gas	185	291	317	364	375	kW
to surrounding air	15	22	25	28	28	kW
to charge air cooler circuit	24	63	81	103	109	kW
Coolant flow @ back pressure in water circuit for charge air cooler	169@0.06	202@0.08	205@0.08	200@0.08	200@0.08	dm ³ @bar
Max. water inlet temp. to charge air cooler	40	40	40	40	40	°C
Air consumption	19	33	42	50	52	kg/min
Air temperature						
before charge air cooler	121	172	180	197	200	°C
after charge air cooler	46	57	63	71	74	°C
Pressure in intake manifold	0.9	1.7	1.9	2.1	2.1	Bar
Exhaust flow	20	35	44	51	54	kg/min
Exhaust temperature	513	477	424	418	412	°C



DI16 073M, 552 kW / 750 hp - With keel cooling, double circuit (engine ref. 03-33)

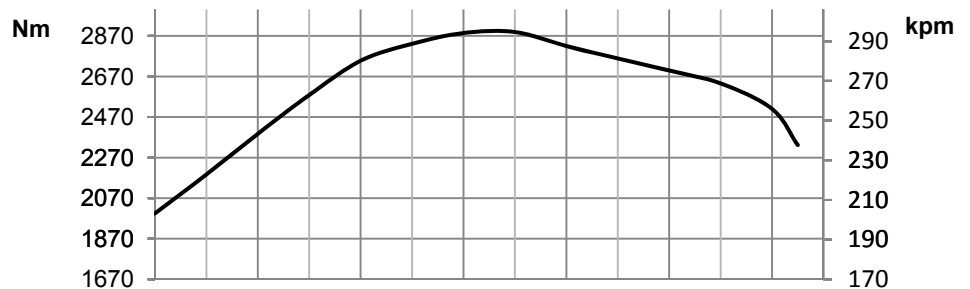
Power

(kW x 1.36 = hp)



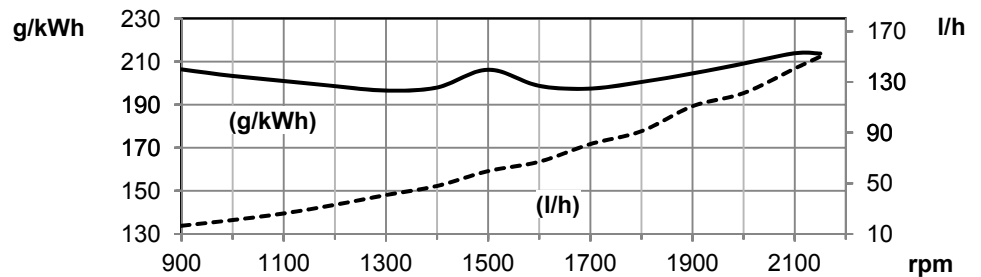
Torque

(Nm / 9.81 = kpm)



Spec. fuel consumption

(g/kWh / 1.36 = g/hph)



----- Propeller curve, assumed exponent 2.5
— Full load curve

6A



Technical data

DI16 073M, 588 kW / 800 hp - With keel cooling, double circuit (engine ref. 03-34)

Emission compliance:	Fuel injection system	Rating
EU Stage IIIA, IMO Tier II	PDE	IFN, Intermittent service

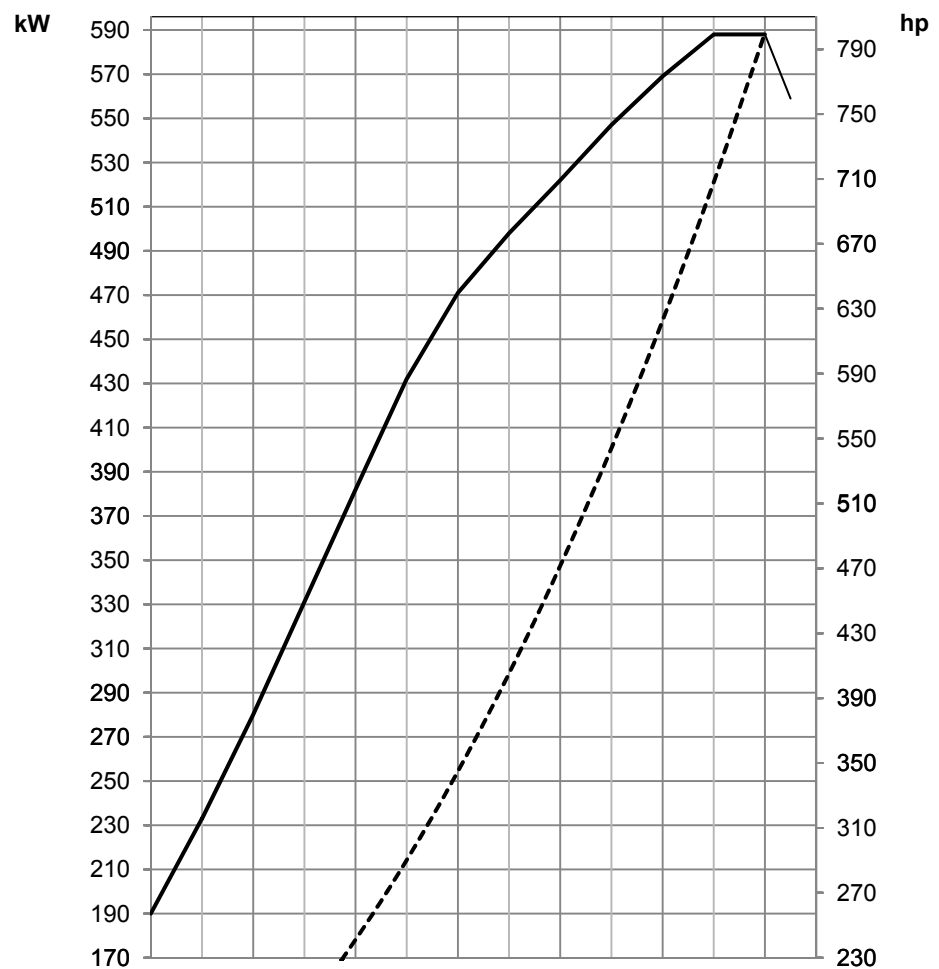
	Engine speed (rpm)					Unit
	1200	1500	1800	2000	2100	
Gross power						
Full load curve	331	471	547	588	588	kW
	450	641	744	800	800	hp
Propeller curve (assumed exponent 2.5)	145	254	400	520	588	kW
	197	345	544	708	800	hp
Gross torque	2634	2998	2902	2807	2674	Nm
Spec. fuel consumption						
full load	199	206	202	210	215	g/kWh
3/4 load	196	212	203	210	222	g/kWh
1/2 load	199	210	207	215	234	g/kWh
Propeller curve (assumed exponent 2.5)	35	64	97	129	151	l/h
Heat rejection						
to main coolant circuit	234	306	330	368	382	kW
to exhaust gas	188	299	337	391	405	kW
to surrounding air	16	23	26	29	30	kW
to charge air cooler circuit	25	67	88	111	118	kW
Coolant flow @ back pressure in water circuit for charge air cooler	169@0.06	202@0.08	205@0.08	200@0.08	200@0.08	dm ³ @bar
Max. water inlet temp. to charge air cooler	40	40	40	40	40	°C
Air consumption	19	34	44	51	53	kg/min
Air temperature						
before charge air cooler	123	176	187	206	209	°C
after charge air cooler	46	58	65	74	76	°C
Pressure in intake manifold	1.0	1.8	2.0	2.2	2.2	Bar
Exhaust flow	21	36	45	53	56	kg/min
Exhaust temperature	514	480	432	431	428	°C



DI16 073M, 588 kW / 800 hp - With keel cooling, double circuit (engine ref. 03-34)

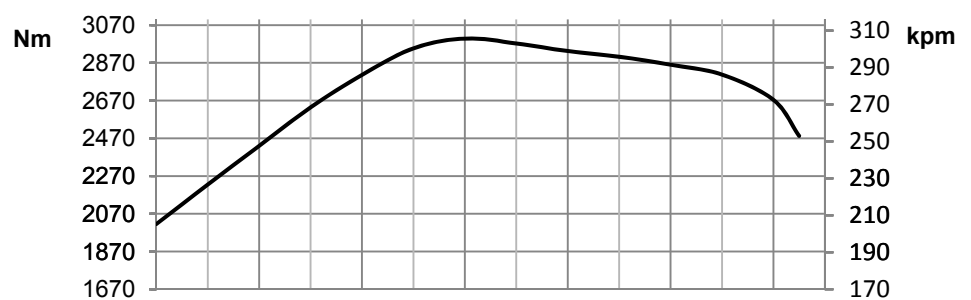
Power

(kW x 1.36 = hp)



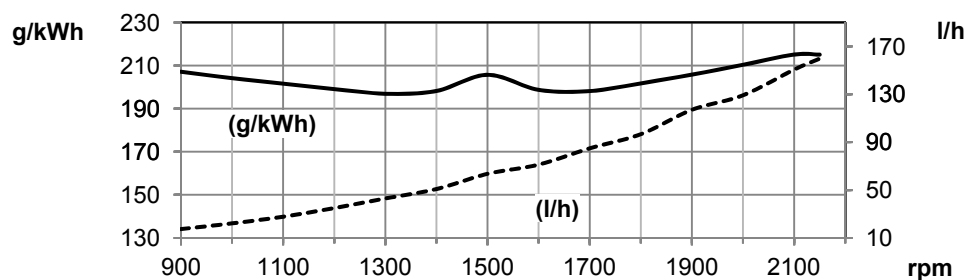
Torque

(Nm / 9.81 = kpm)



Spec. fuel consumption

(g/kWh / 1.36 = g/hph)



----- Propeller curve, assumed exponent 2.5
— Full load curve



Technical data

DI16 079M, 405 kW / 550 hp - With keel cooling, double circuit (engine ref. 03-51)

Emission compliance	Fuel injection system	Rating
EU Stage IIIA, IMO Tier II	PDE	ICFN, Continuous service

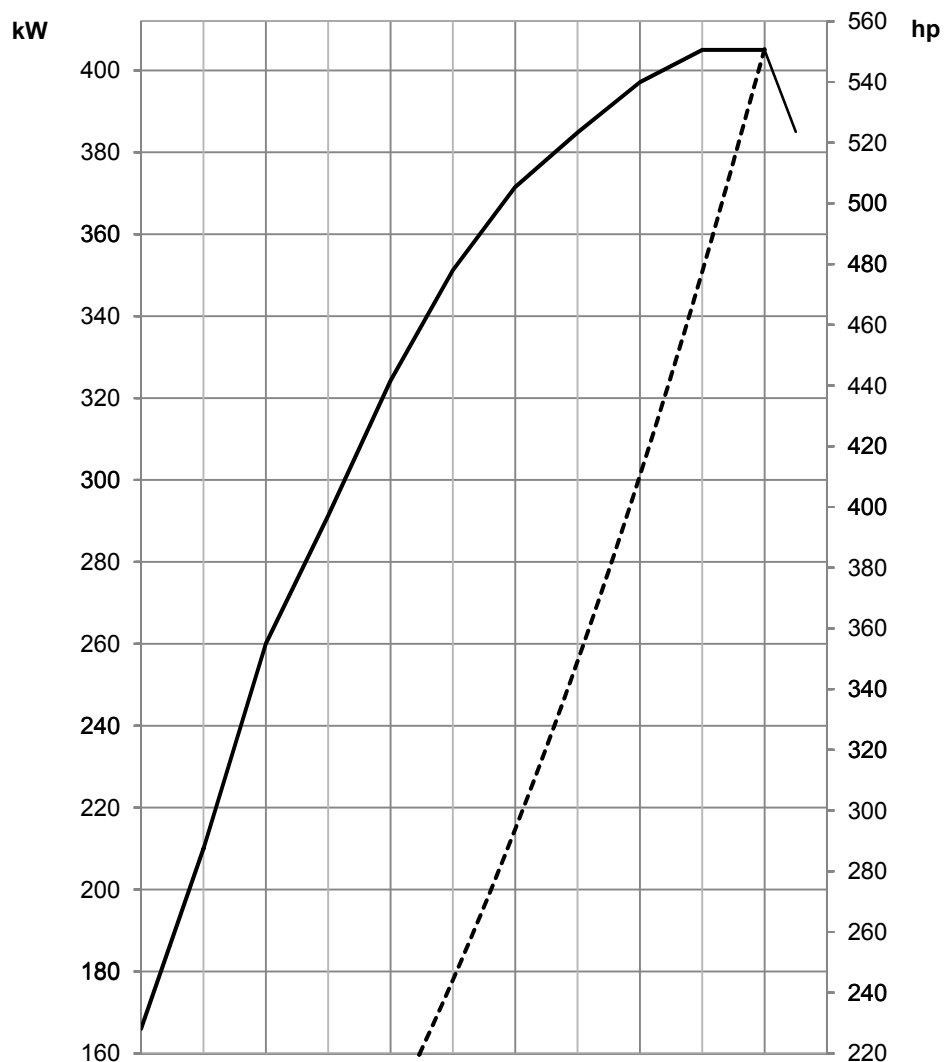
	Engine speed (rpm)				Unit
	1200	1500	1700	1800	
Gross power					
Full load curve	324	385	405	405	kW
	441	523	550	550	hp
Propeller curve (assumed exponent 2.5)	147	257	351	405	kW
	200	349	477	550	hp
Gross torque	2580	2450	2275	2149	Nm
Spec. fuel consumption					
full load	198	201	199	210	g/kWh
3/4 load	197	202	201	214	g/kWh
1/2 load	204	204	205	221	g/kWh
Propeller curve (assumed exponent 2.5)	36	62	83	101	l/h
Heat rejection					
to main coolant circuit	223	249	252	268	kW
to exhaust gas	185	233	241	266	kW
to surrounding air	15	18	19	20	kW
to charge air cooler circuit	25	45	51	63	kW
Coolant flow @ back pressure in water circuit for charge air cooler	184@0.07	205@0.09	205@0.08	205@0.08	dm ³ @bar
Max. water inlet temp. to charge air cooler	40	40	40	40	°C
Air consumption	20	29	33	38	kg/min
Air temperature					
before charge air cooler	121	144	145	158	°C
after charge air cooler	46	52	54	58	°C
Pressure in intake manifold	1.0	1.4	1.4	1.5	Bar
Exhaust flow	21	30	35	39	kg/min
Exhaust temperature	505	443	411	403	°C



DI16 079M, 405 kW / 550 hp - With keel cooling, double circuit (engine ref. 03-51)

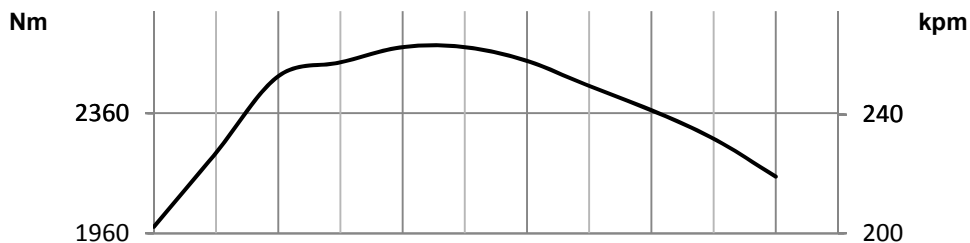
Power

(kW x 1.36 = hp)



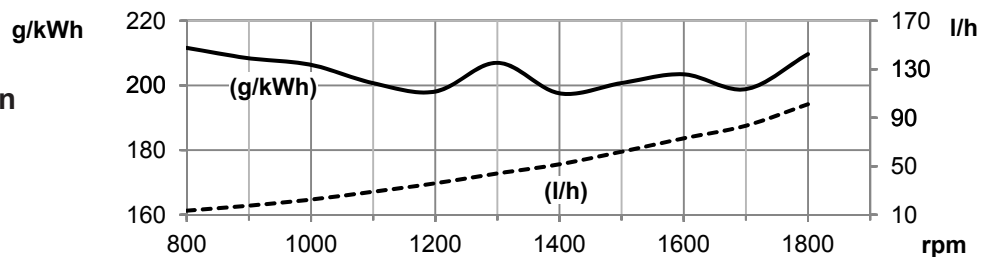
Torque

(Nm / 9.81 = kpm)



Spec. fuel consumption

(g/kWh / 1.36 = g/hph)



----- Propeller curve, assumed exponent 2.5
—— Full load curve



Technical data

DI16 079M, 460 kW / 625 hp - With keel cooling, double circuit (engine ref. 03-52)

Emission compliance	Fuel injection system	Rating
EU Stage IIIA, IMO Tier II	PDE	ICFN, Continuous service

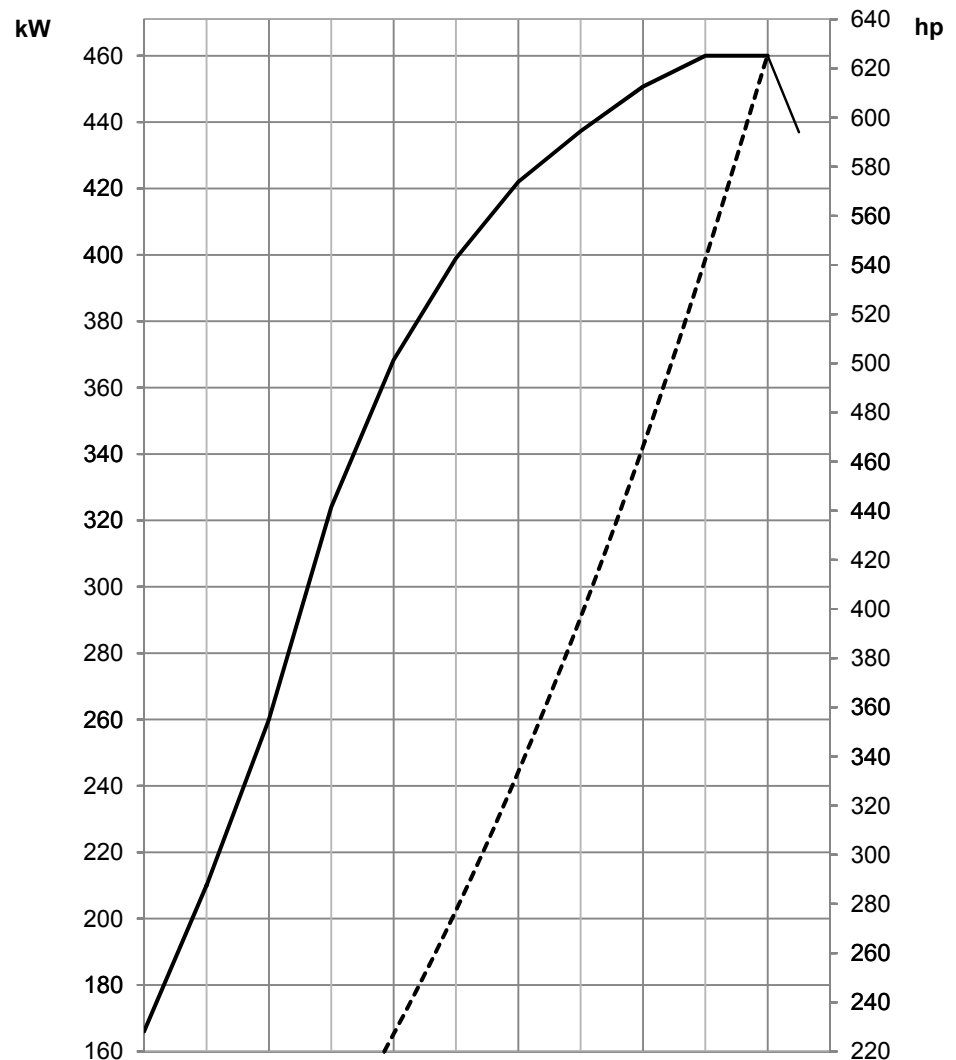
	Engine speed (rpm)				Unit
	1200	1500	1700	1800	
Gross power					
Full load curve	368	437	460	460	kW
	501	595	625	625	hp
Propeller curve (assumed exponent 2.5)	167	292	399	460	kW
	227	397	542	625	hp
Gross torque	2931	2784	2584	2440	Nm
Spec. fuel consumption					
full load	199	199	199	207	g/kWh
3/4 load	197	202	200	211	g/kWh
1/2 load	201	202	202	218	g/kWh
Propeller curve (assumed exponent 2.5)	40	70	94	113	l/h
Heat rejection					
to main coolant circuit	253	277	282	294	kW
to exhaust gas	212	259	276	294	kW
to surrounding air	17	21	22	23	kW
to charge air cooler circuit	32	54	63	73	kW
Coolant flow @ back pressure in water circuit for charge air cooler	184@0.07	205@0.09	205@0.08	205@0.08	dm ³ @bar
Max. water inlet temp. to charge air cooler	40	40	40	40	°C
Air consumption	22	31	36	40	kg/min
Air temperature					
before charge air cooler	137	158	160	169	°C
after charge air cooler	48	55	58	61	°C
Pressure in intake manifold	1.2	1.6	1.6	1.7	Bar
Exhaust flow	23	33	38	42	kg/min
Exhaust temperature	523	455	427	416	°C



DI16 079M, 460 kW / 625 hp - With keel cooling, double circuit (engine ref. 03-52)

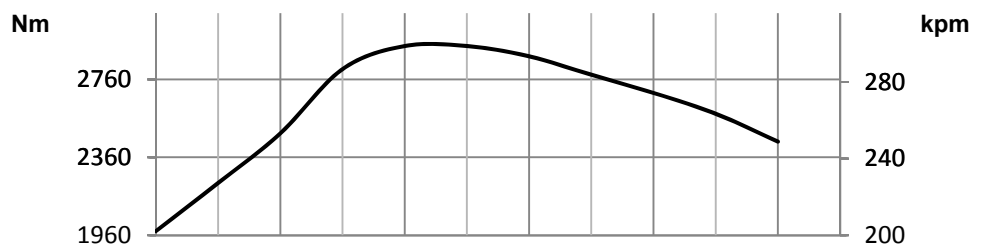
Power

(kW x 1.36 = hp)



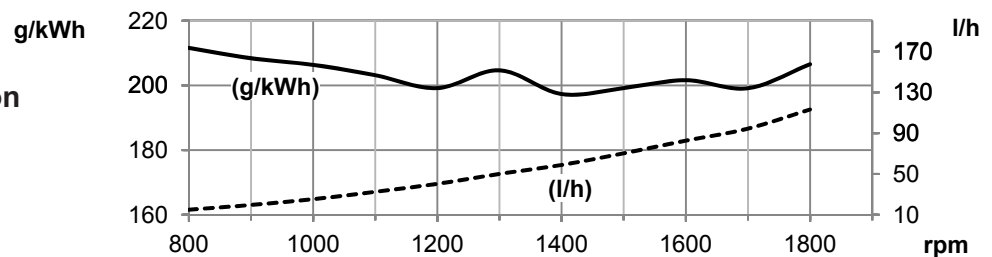
Torque

(Nm / 9.81 = kpm)



Spec. fuel consumption

(g/kWh / 1.36 = g/hph)



----- Propeller curve, assumed exponent 2.5
— Full load curve



Technical data

DI16 079M, 515 kW / 700 hp - With keel cooling, double circuit (engine ref. 03-53)

Emission compliance	Fuel injection system	Rating
EU Stage IIIA, IMO Tier II	PDE	ICFN, Continuous service

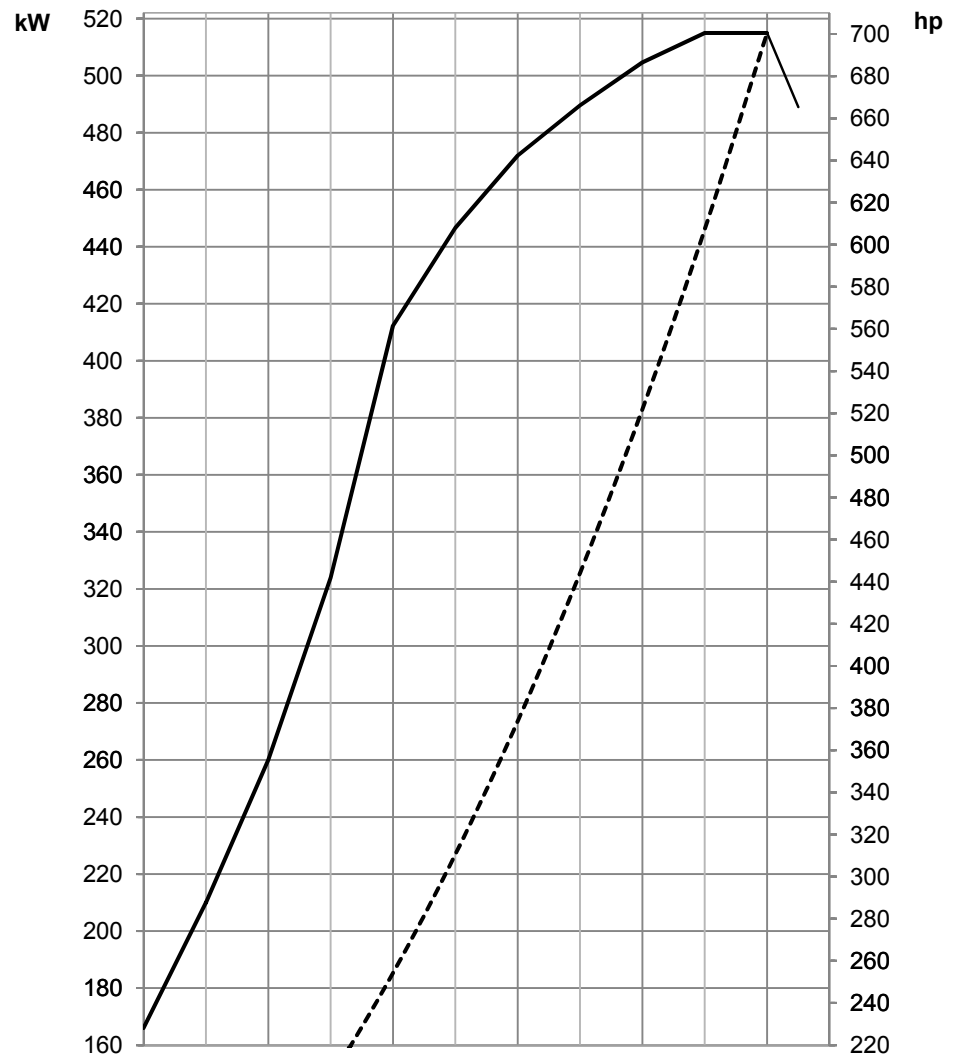
	Engine speed (rpm)				Unit
	1200	1500	1700	1800	
Gross power					
Full load curve	412	490	515	515	kW
	561	666	700	700	hp
Propeller curve (assumed exponent 2.5)	187	326	446	515	kW
	254	444	607	700	hp
Gross torque	3281	3117	2893	2732	Nm
Spec. fuel consumption					
full load	202	198	200	204	g/kWh
3/4 load	198	201	199	210	g/kWh
1/2 load	199	203	201	217	g/kWh
Propeller curve (assumed exponent 2.5)	45	78	106	125	l/h
Heat rejection					
to main coolant circuit	288	304	313	321	kW
to exhaust gas	242	287	311	323	kW
to surrounding air	20	23	25	25	kW
to charge air cooler circuit	41	65	75	82	kW
Coolant flow @ back pressure in water circuit for charge air cooler	181@0.07	205@0.09	205@0.08	205@0.08	dm ³ @bar
Max. water inlet temp. to charge air cooler	40	40	40	40	°C
Air consumption	24	34	39	42	kg/min
Air temperature					
before charge air cooler	155	171	175	180	°C
after charge air cooler	52	58	61	64	°C
Pressure in intake manifold	1.4	1.8	1.8	1.9	Bar
Exhaust flow	25	35	41	44	kg/min
Exhaust temperature	540	466	442	432	°C



DI16 079M, 515 kW / 700 hp - With keel cooling, double circuit (engine ref. 03-53)

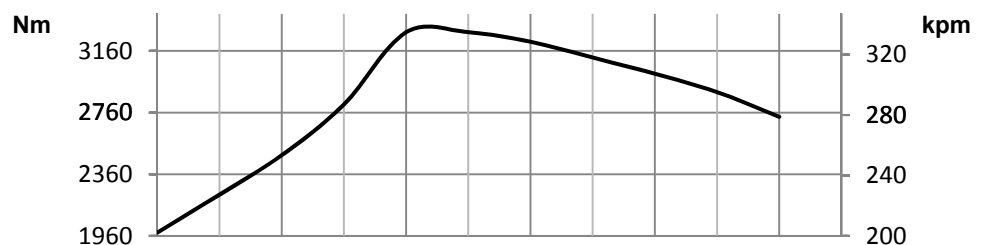
Power

(kW x 1.36 = hp)



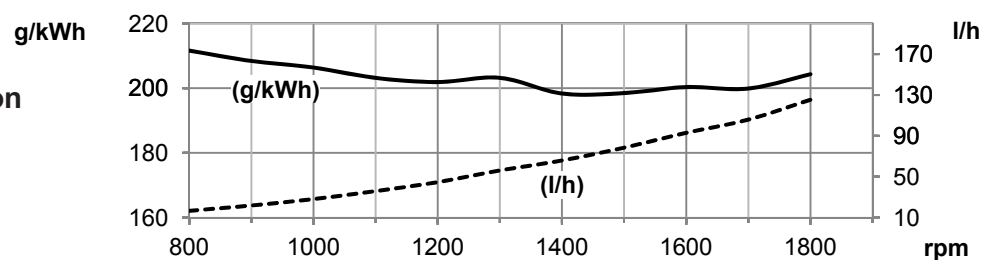
Torque

(Nm / 9.81 = kpm)



Spec. fuel consumption

(g/kWh / 1.36 = g/hph)



----- Propeller curve, assumed exponent 2.5
— Full load curve



Technical data

DI16 079M, 552 kW / 750 hp - With keel cooling, double circuit (engine ref. 03-54)

Emission compliance	Fuel injection system	Rating
EU Stage IIIA, IMO Tier II	PDE	ICFN, Continuous service

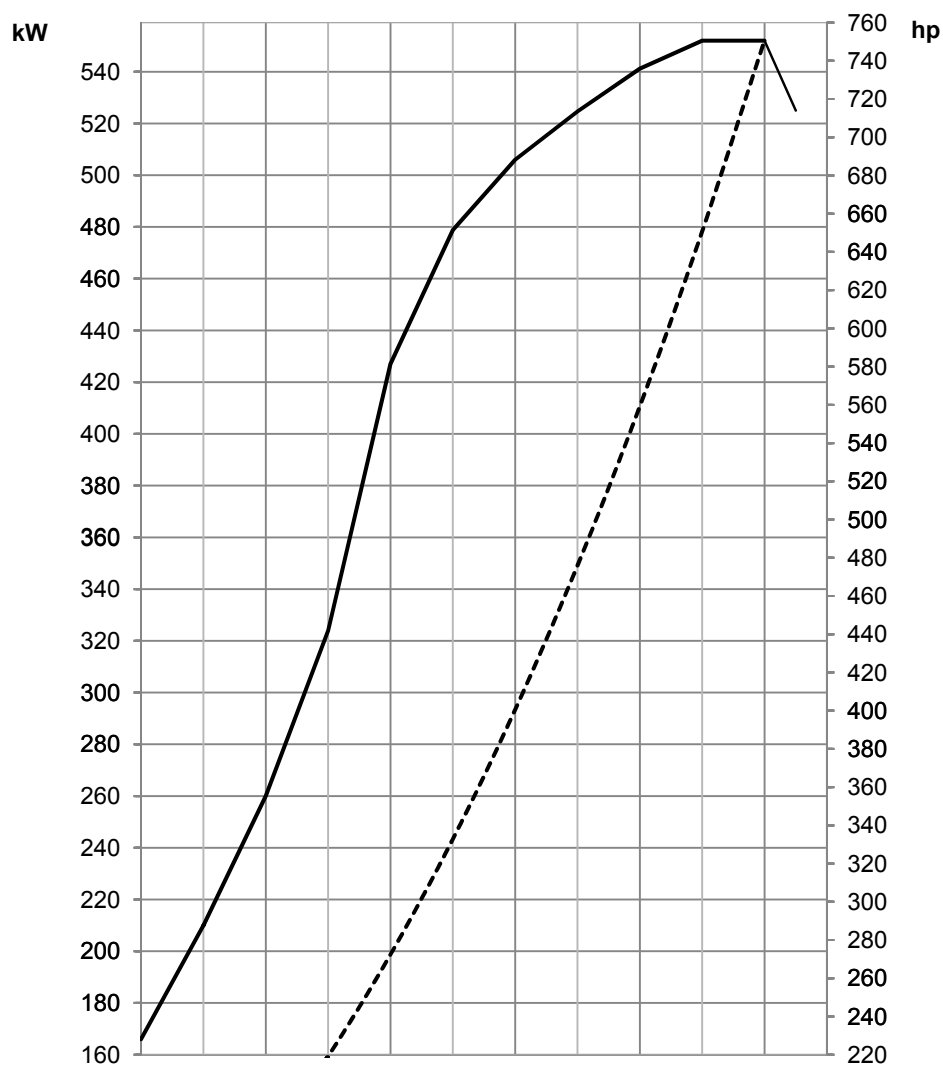
	Engine speed (rpm)				Unit
	1200	1500	1700	1800	
Gross power					
Full load curve	427	525	552	552	kW
	581	714	750	750	hp
Propeller curve (assumed exponent 2.5)	200	350	478	552	kW
	272	476	651	750	hp
Gross torque	3398	3340	3101	2928	Nm
Spec. fuel consumption					
full load	203	199	201	205	g/kWh
3/4 load	198	201	199	209	g/kWh
1/2 load	198	203	201	216	g/kWh
Propeller curve (assumed exponent 2.5)	47	84	113	135	l/h
Heat rejection					
to main coolant circuit	300	326	337	346	kW
to exhaust gas	252	307	337	348	kW
to surrounding air	21	25	27	27	kW
to charge air cooler circuit	44	72	85	91	kW
Coolant flow @ back pressure in water circuit for charge air cooler	180@0.07	205@0.09	205@0.08	205@0.08	dm ³ @bar
Max. water inlet temp. to charge air cooler	40	40	40	40	°C
Air consumption	24	35	41	44	kg/min
Air temperature					
before charge air cooler	161	180	186	189	°C
after charge air cooler	53	59	64	66	°C
Pressure in intake manifold	1.5	1.9	2.0	2.0	Bar
Exhaust flow	26	37	43	45	kg/min
Exhaust temperature	547	473	453	444	°C



DI16 079M, 552 kW / 750 hp - With keel cooling, double circuit (engine ref. 03-54)

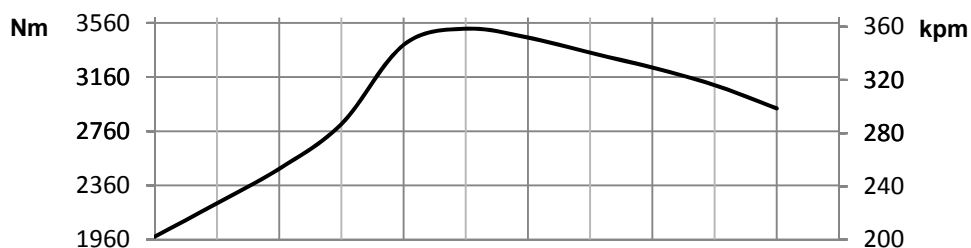
Power

(kW x 1.36 = hp)



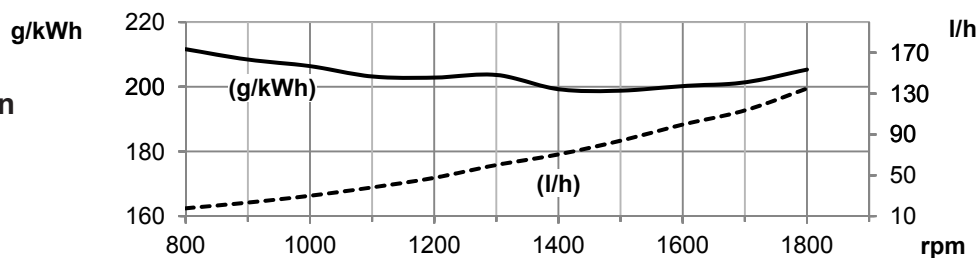
Torque

(Nm / 9.81 = kpm)



Spec. fuel consumption

(g/kWh / 1.36 = g/hph)



----- Propeller curve, assumed exponent 2.5
— Full load curve



Basic dimensions

The basic dimensions are indicated with coordinates. The coordinate system is three dimensional and consists of three planes at straight angles to each other; x, y and z. The dimensions are indicated in mm from crankshaft centre.

DI16 070/072/077M - With heat exchanger

- 1 Air intake (Ø 150 mm)

1a	x	-464	1b	x	-464
	y	+543		y	-544
	z	+642		z	+641

- 2 Exhaust outlet (Ø 115 mm)

2a	x	+84	2b	x	+84
	y	+477		y	-478
	z	+576		z	+575

- 3 Sea water inlet (Ø 50 mm)

3	x	+123
	y	-293
	z	+119

- 4 Sea water outlet (Ø 51 mm)

4a	x	-144	4b	x	-92
	y	467		y	-467
	z	+77		z	+77

- 5 Coolant drain

- 6 Fresh water filling

- 7 Fuel inlet
(M18x1.5, with nipples
for hose: inner Ø 9 mm)

7	x	-1165
	y	-452
	z	+199

- 8 Fuel return
(M18x1.5, with nipples
for hose: inner Ø 9 mm)

8	x	-1125
	y	-456
	z	+199

- 9 Oil filling

- 10 Oil dipstick

- 11 Oil drain plug

- 12 Connection from cab heater
(M26x1.5)

12	x	-1041
	y	+544
	z	+280

- 13 Connection to cab heater
(M26x1.5)

13	x	-1092
	y	+364
	z	+83

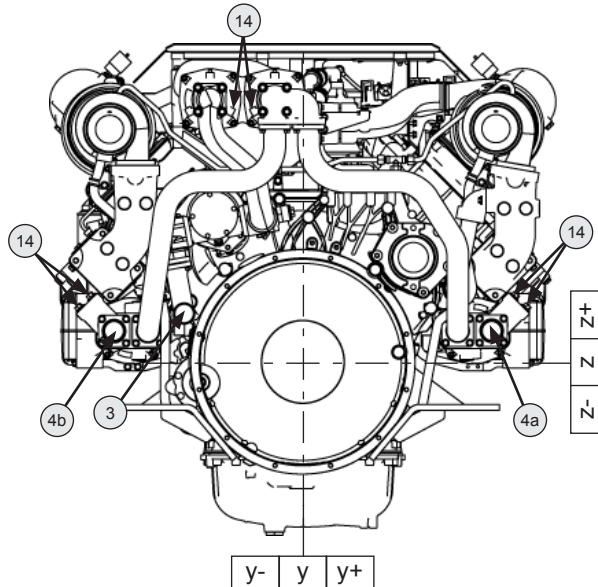
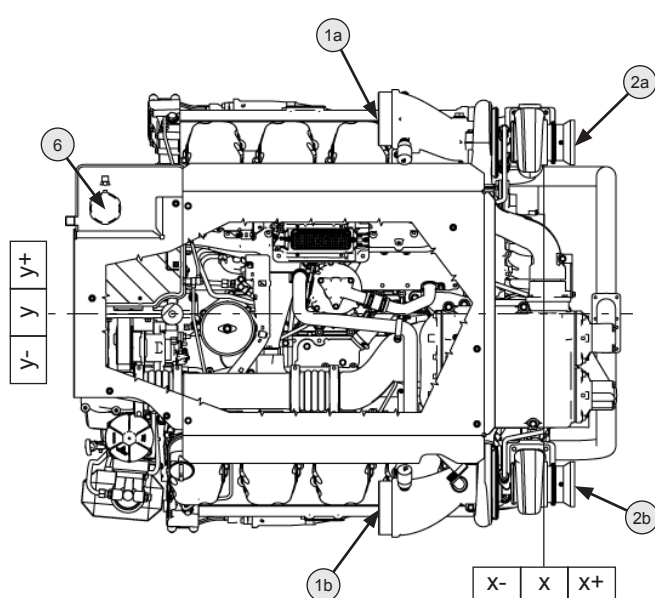
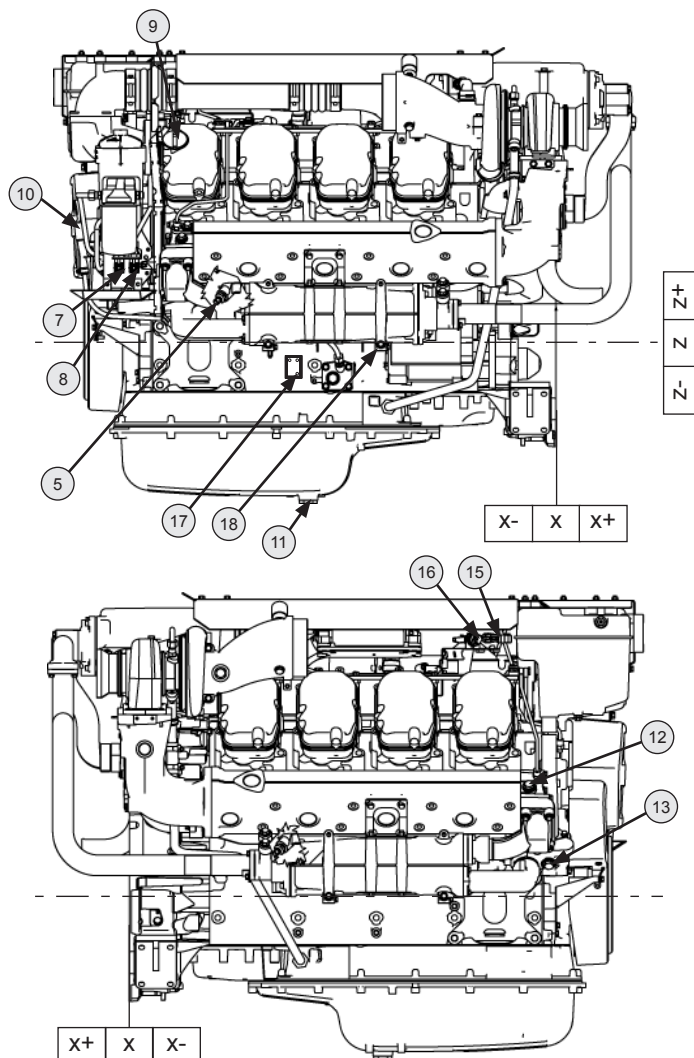
- 14 Sacrificial anode

- 15 Customer interface EMS

- 16 Diagnostic socket

- 17 Battery connection + (M10)

- 18 Battery connection - (M12)



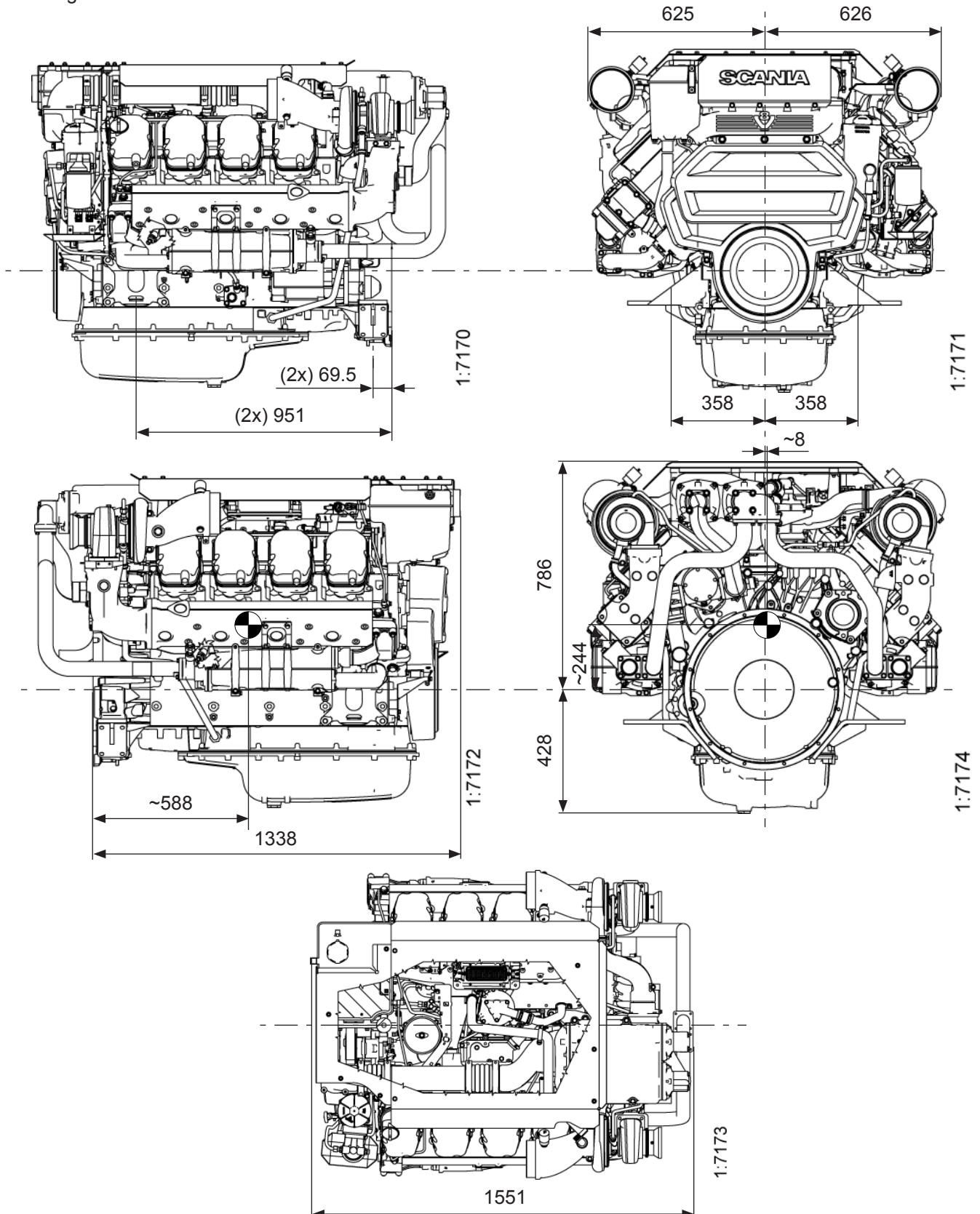


Dimensional drawings

All sketches are only intended as general sales information and must not be used for any installation purposes. The values for centre of gravity applies for engines with standard equipment including coolant. All dimensions are indicated in mm.

DI16 070/072/077M - With heat exchanger

Drawing no 2 103 570



6A



Basic dimensions

The basic dimensions are indicated with coordinates. The coordinate system is three dimensional and consists of three planes at straight angles to each other; x, y and z. The dimensions are indicated in mm from crankshaft centre.

DI16 071M - With keel cooling, single circuit

- 1 Air intake (Ø 150 mm)

1a	x	-464	1b	x	-464
	y	+543		y	-544
	z	+642		z	+641

- 2 Exhaust outlet (Ø 115 mm)

2a	x	+24	2b	x	+24
	y	+477		y	-478
	z	+576		z	+575

- 3 Main coolant inlet (Ø 63 mm)

3	x	-1033
	y	+404
	z	+43

- 4 Main coolant outlet (Ø 63 mm)

4	x	-1124
	y	+566
	z	+180

- 5 Coolant drain

- 6 Coolant bleed pipe (Ø 8 mm)

- 7 Fuel inlet
(M18x1.5, with nipples
for hose: inner Ø 9 mm)

7	x	-1165
	y	-452
	z	+199

- 8 Fuel return
(M18x1.5, with nipples
for hose: inner Ø 9 mm)

8	x	-1125
	y	-456
	z	+199

- 9 Oil filling

- 10 Oil dipstick

- 11 Oil drain plug

- 12 Connection from cab heater
(M26x1.5)

12	x	-1041
	y	+544
	z	+280

- 13 Connection to cab heater
(M26x1.5)

13	x	-1092
	y	+364
	z	+83

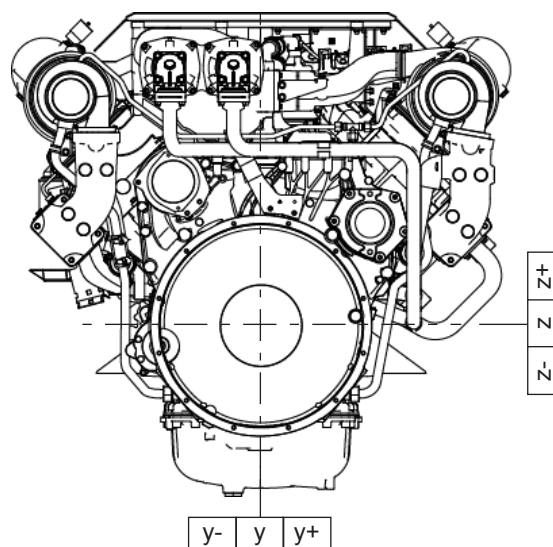
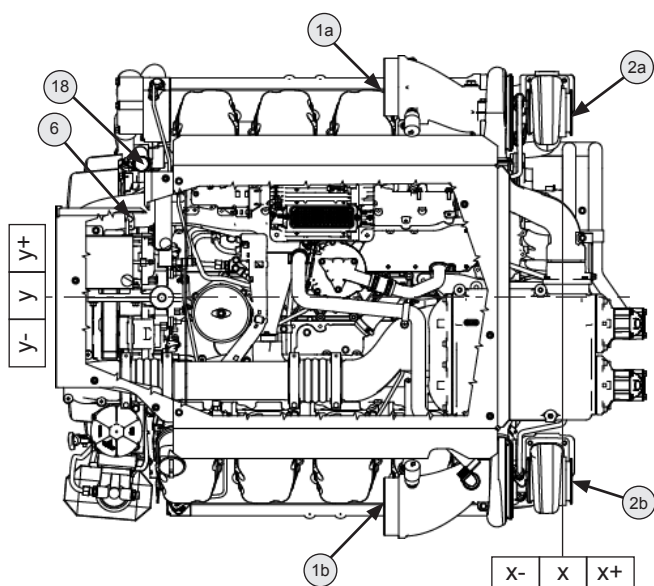
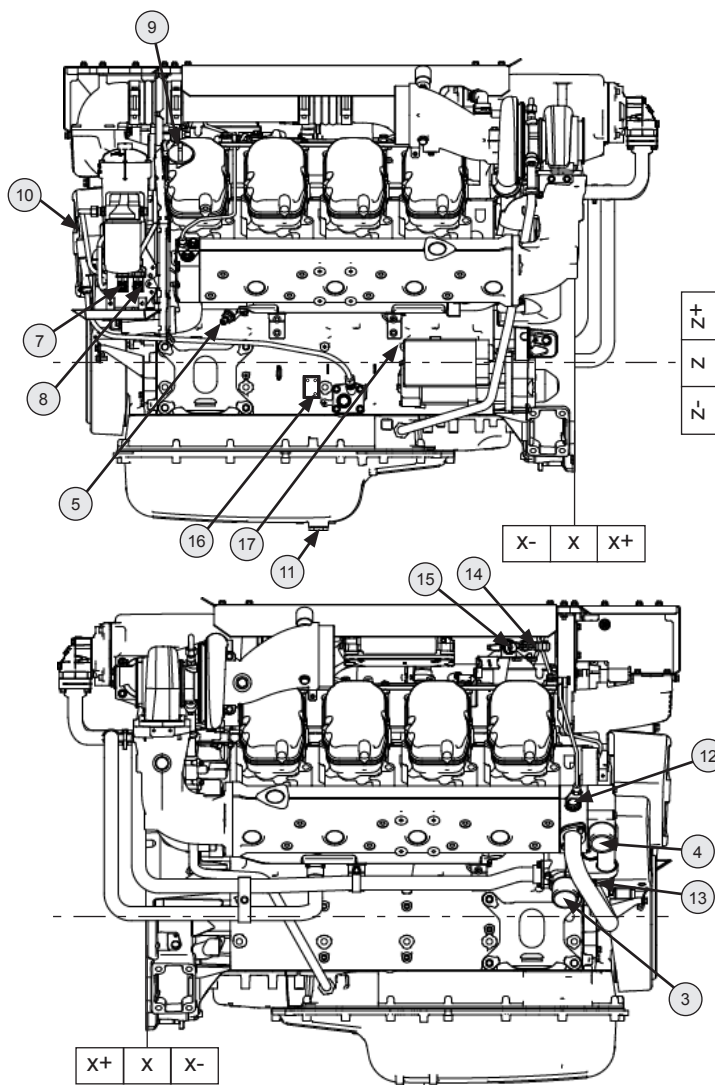
- 14 Customer interface EMS

- 15 Diagnostic socket

- 16 Battery connection + (M10)

- 17 Battery connection - (M12)

- 18 Static line (Ø 38 mm)



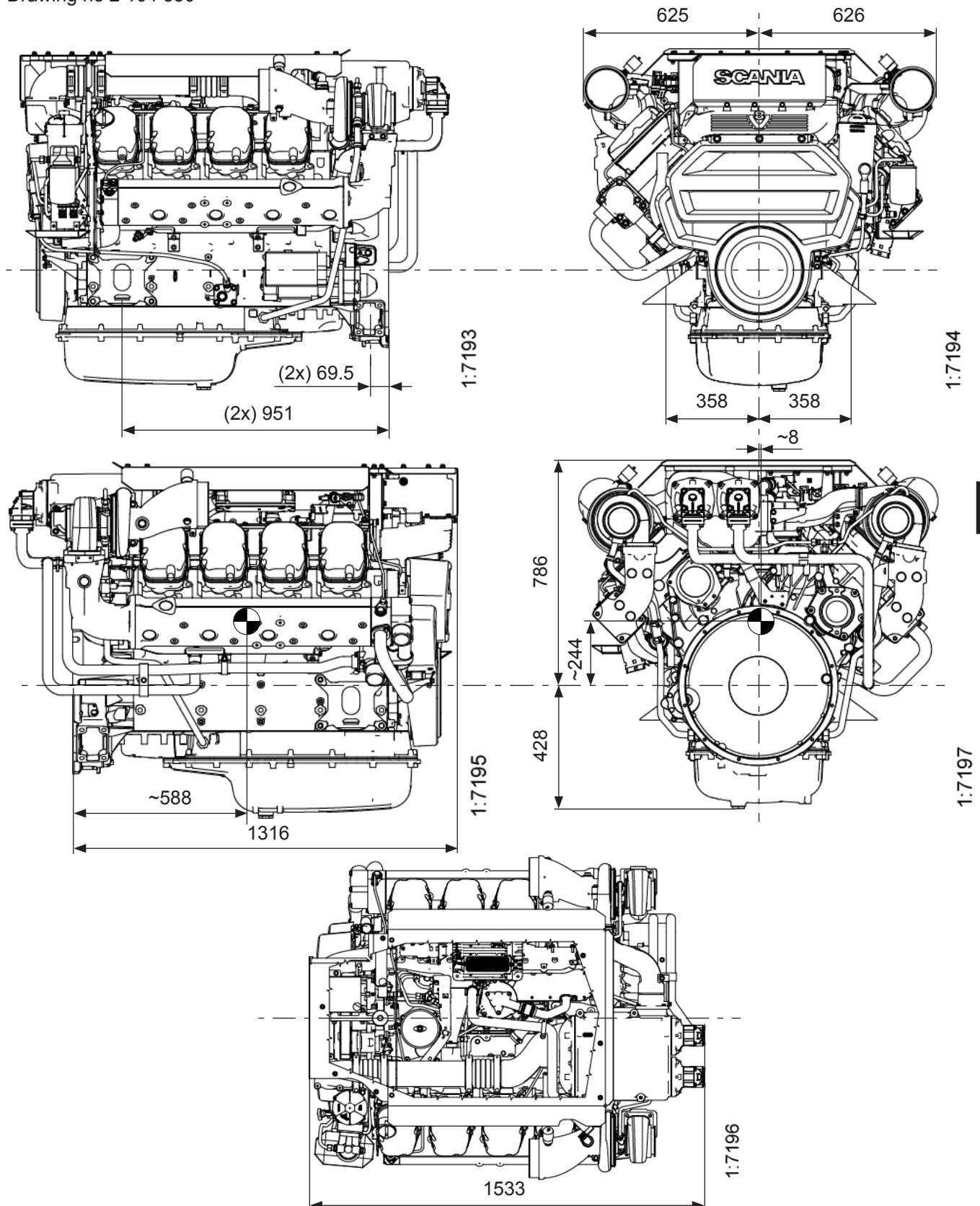


Dimensional drawings

All sketches are only intended as general sales information and must not be used for any installation purposes. The values for centre of gravity applies for engines with standard equipment including coolant. All dimensions are indicated in mm.

DI16 071M - With keel cooling, single circuit

Drawing no 2 104 350



6A



Basic dimensions

The basic dimensions are indicated with coordinates. The coordinate system is three dimensional and consists of three planes at straight angles to each other; x, y and z. The dimensions are indicated in mm from crankshaft centre.

DI16 073/079M - With keel cooling, double circuit

- 1 Air intake (Ø 150 mm)

1a	x	-464	1b	x	-464
	y	+543		y	-544
	z	+642		z	+641

- 2 Exhaust outlet (Ø 115 mm)

2a	x	+24	2b	x	+24
	y	+477		y	-478
	z	+576		z	+575

- 3 Main coolant inlet (Ø 63 mm)

3	x	-1033
	y	+404
	z	+43

- 4 Main coolant outlet (Ø 63 mm)

4	x	-1124
	y	+566
	z	+180

- 5 Coolant drain

- 6 Coolant bleed pipe (Ø 8 mm)

- 7 Fuel inlet
(M18x1.5, with nipples
for hose: inner Ø 9 mm)

7	x	-1165
	y	-452
	z	+199

- 8 Fuel return
(M18x1.5, with nipples
for hose: inner Ø 9 mm)

8	x	-1125
	y	-456
	z	+199

- 9 Oil filling

- 10 Oil dipstick

- 11 Oil drain plug

- 12 Connection from cab heater
(M26x1.5)

12	x	-1041
	y	+544
	z	+280

- 13 Connection to cab heater
(M26x1.5)

13	x	-1092
	y	+364
	z	+83

- 14 Customer interface EMS

- 15 Diagnostic socket

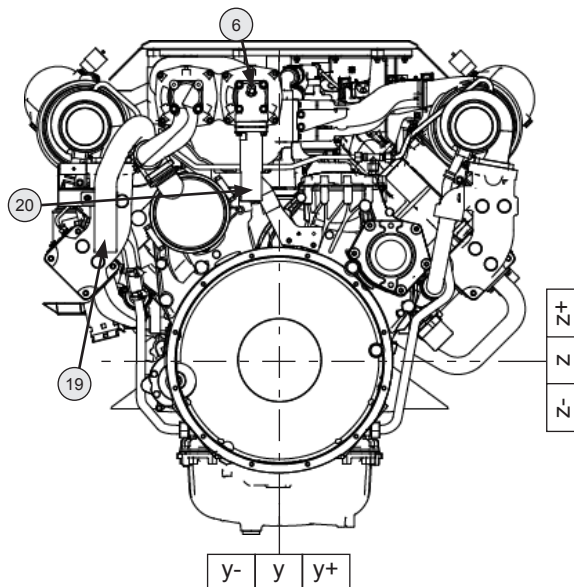
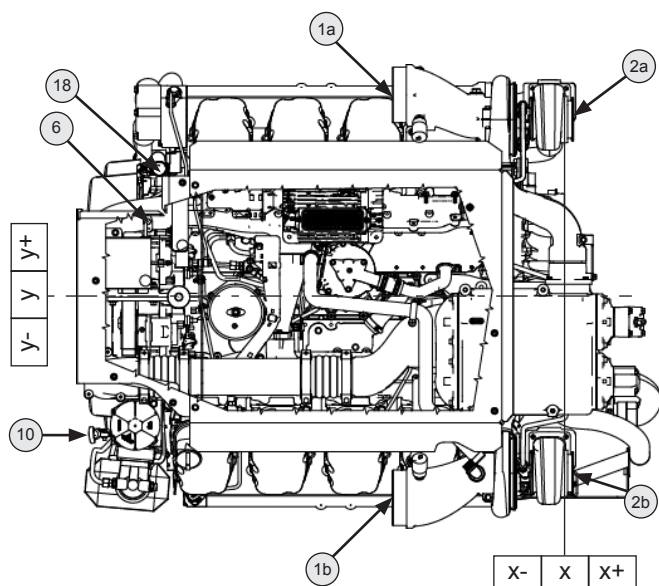
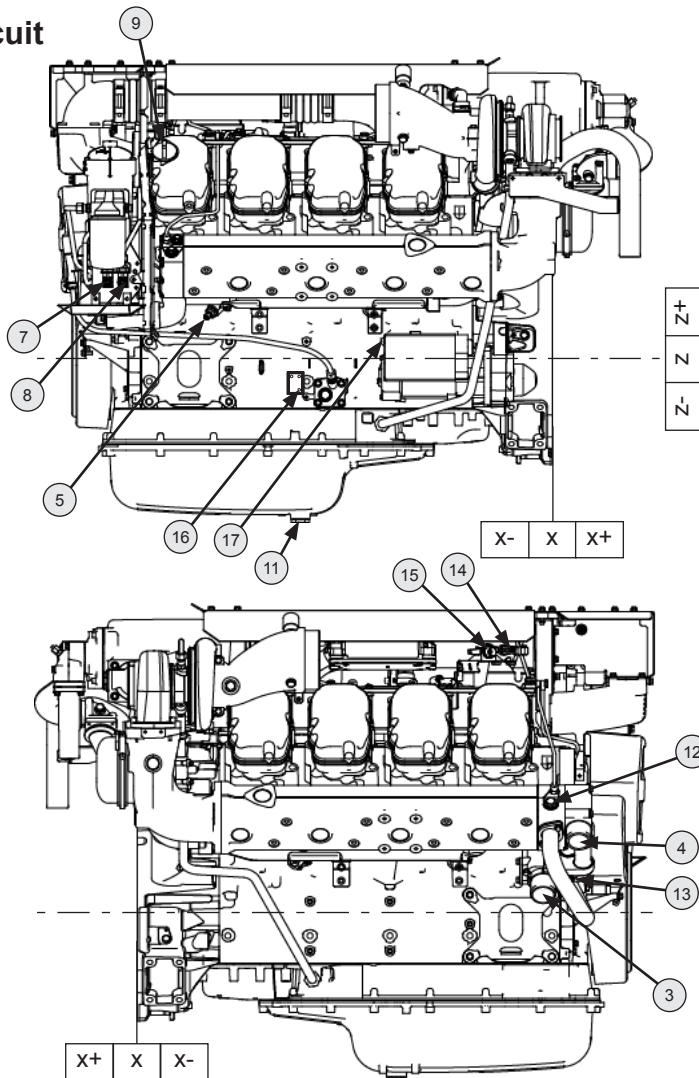
- 16 Battery connection + (M10)

- 17 Battery connection - (M12)

- 18 Static line (Ø 38 mm)

- 19 Coolant inlet from CAC external circuit (Ø 51 mm)

- 20 Coolant outlet to CAC external circuit (Ø 51 mm)



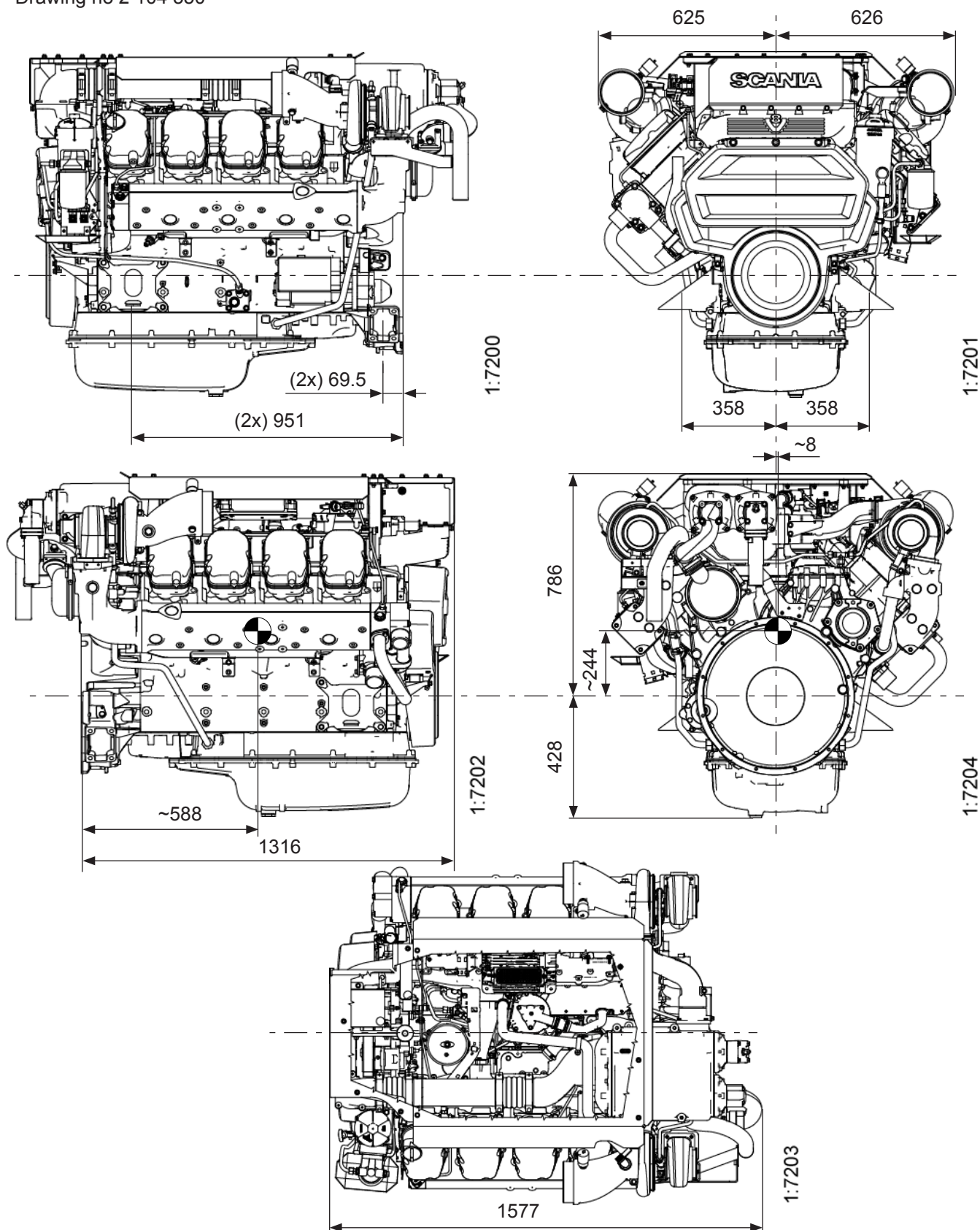


Dimensional drawings

All sketches are only intended as general sales information and must not be used for any installation purposes. The values for centre of gravity applies for engines with standard equipment including coolant. All dimensions are indicated in mm.

DI16 073/079M - With keel cooling, double circuit

Drawing no 2 104 350

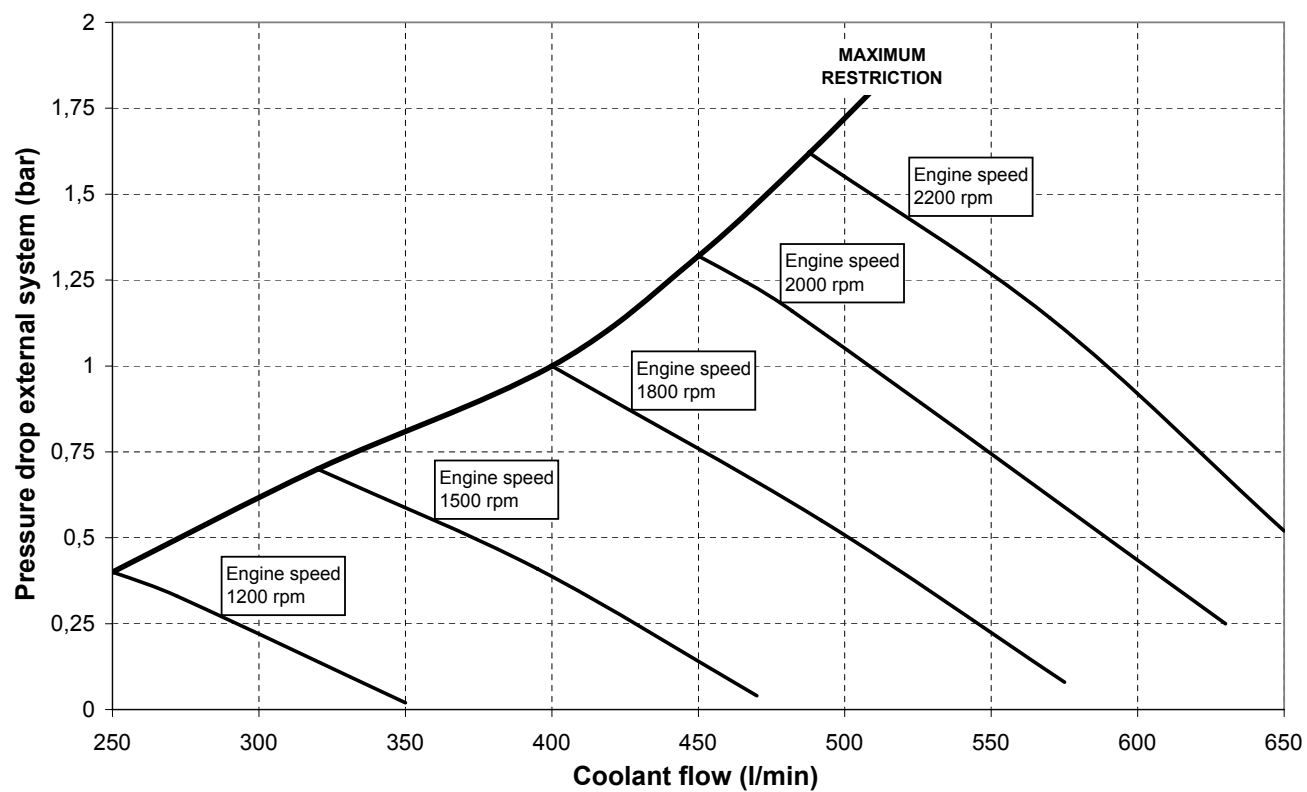


6A



Coolant flow

The coolant flow depends on the pressure drop in the external system according to the graph below.
Valid for all DI16.





Equipment list

S = Standard

O = Optional

For illustrations and technical data, please see 'Equipment data'.

Drawings referred to in this section are available on Scania's Technical Information Library, TIL, under 'Drawings industrial & marine engines' or can be ordered via Pre-sales FRAS.

Ref	Description	Requirements	Remark	Drw No
10K	TORSIONAL VIBRATION CALCULATIONS			
-00	S Without			
-01	O Single engine installation with 1-3 driven masses. Typical genset or direct driven propeller installations.		Note! TVC can not be ordered directly.	
-02	O Several driven masses both behind and/or in front of the engine. Genset with auxiliary devices, propeller installations with front PTO, propeller installations with marine transmissions.		Torsional vibration calculations must be requested with the TVC form available at https://sail.scania.com and sent to factory for evaluation, before an actual order can be placed.	
-03	O Branched drive train, multi engine (advanced) installations, belt driven units etc.		If a TVC calculation has been rejected, further investigation is possible and will be charged per hour.	
10M	CLASSIFICATION			
	Note! For information about approved engines, access SAIL at http://sail.scania.com .			
-00	S Without			
-01	O ABS: American Bureau of Shipping	Req. 65-03		
-02	O BV: Bureau Veritas	Req. 65-02 or -03		
-03	O DNV: Det Norske Veritas	Req. 65-02 or -03		
-04	O GL: Germanischer Lloyd	Req. 65-02 or -03		
-05	O LR: Lloyds Register	Req. 65-03		
-06	O RINA: Registro Italiano Navale	Req. 65-03		
-11	O SF: Sjöfartsverket			
-12	O RS: Russian Maritime Register of Shipping	Req. 65-02 or -03		
-13	O RRR: Russian River Register		Only prepared for RRR Classification.	
-14	O CCS: China Classification Society	Req. 65-02 or -03		
-15	O TL: Türk Loydu	Req. 65-03		
-16	O CRS: Croatian Register of Shipping	Req. 65-02 or -03		



Ref	Description	Requirements	Remark	Drw No
100	TYPE OF IMO CERTIFICATE			
	<i>Note! Ships in Russia: All engines above 130 kW on vessels with flag state Russia, except emergency engines, must have EIAPP certificate issued by Russian Maritime Register of Shipping, 10O-05.</i>			
	<i>Note! Ships in China: All engines above 130 kW on vessels with flag state China, except emergency engines, must have EIAPP certificate issued by China Classification Society, 10O-06.</i>			
	<i>Note! EIAPP for German-flagged vessels will have an additional fee due to extra costs caused by the German Administration.</i>			
-00	S Without			
-01	O EIAPP certificate issued by Germanischer Lloyd - GL			
-02	O S.o.C certificate issued by Germanischer Lloyd - GL			
-05	O EIAPP certificate issued by Russian Maritime Register of Shipping - RS	Req. 10M-12	No EIAPP certificate will be issued if the engine is not classified by RS.	
-06	O EIAPP certificate issued by China Classification Society - CCS	Req. 10M-14	No EIAPP certificate will be issued if the engine is not classified by CCS.	
25A	CONNECTION EMS			
<i>The connector kit contains pins and connector for connecting to the electrical interface on the engine. The customer will attach the wirings to the connectors himself.</i>				
-00	O Without	Req. 26C-01 or 27C-01/02		
-01	S With connector kit	Req. 26C-00 and 27C-00		
-02	O With cable 6.3 m incl. connector	Req. 26C-00 and 27C-00		
25B	OIL TEMP, Integrated oil temp. sensor			
-00	S Without			
-01	O With			
25C	COOLANT LEVEL MONITOR			
<i>The coolant level monitor is used to ensure that the coolant level is not dropping below a critical level that leaves the temperature sensor in the air. If the temperature sensor is not in contact with the coolant, boiling will not be detected, causing a risk for engine damages. The coolant level monitor is strongly recommended since the engine room is mostly remote operated.</i>				
-00	S Without		Note! Requires a level monitor from an external manufacturer.	
-01	O Level monitor 2-pole, normally closed (when mounted in application)	Req. 28F-01, -02, -03 or -04		
25D	STARTER			
-00	O Without			
-01	S 2-pole, 7 kW, EMS controlled			1 882 043
25E	ALTERNATOR			
<i>In the selection of an alternator the total electrical consumption must be considered. It is essential that a reserve of electrical power is available in order to avoid voltage drop in the EMS and problems with equipment such as instrumentation and lighting.</i>				
-00	O Without			
-01	S 2-pole, 100A, EMS controlled			1 743 548
-04	O 2-pole, 2 x 100A, EMS controlled			1 743 548



Ref	Description	Requirements	Remark	Drw No
25F	ENGINE HEATER			
<i>The engine heater will ensure that the engine keeps a temperature level above the ambient for easier starting. Since a warm engine have less friction, emission and operates more smoothly due to warm oil it will be more environmental friendly and significantly reduce engine wear. Engine heater 1500W with thermostat is recommended for customers that will use the heater continuously. Engine heater 500W is recommended for installations with insufficient fusing for using 1500W.</i>				
-00	S Without			
-06	O 1500 W/115 V, plug in with thermostat			2 074 021
-07	O 1500 W/230 V, plug in with thermostat			2 074 021
-08	O 550 W/230 V, plug in with thermostat			2 074 021
-09	O 550 W/115 V, plug in with thermostat			2 074 021
25G	POWER CABLE BETWEEN ALTERNATOR AND STARTER			
<i>The power cable is the feeding cable from the alternator to the starter motor for charging the batteries. The cable is mandatory to have either supplied by Scania or by the customer. The alternator requires constant 24V connected at B+ in order to work correctly.</i>				
-00	O Without			
-01A	S With, for single alternator configuration	Req. 25E-01	Note! The power cable is non-fused and not approved for classification.	
-02	O With, for double alternator configuration	Req. 25E-04		
25H	OIL LEVEL SENSOR			
<i>The oil level sensor enables the engine operator to electronically read the level of oil in the engine as a part of the daily inspection. It is a complement to oil dipstick. The signal must be taken care of by the customer directly from the sensor.</i>				
-00	S Without			
-02	O With, but without electrical connection (connected and monitored by customer)			1 891 847
SCANIA INSTRUMENTATION				
26C	BASE SYSTEM			
-00	S Without			
-01	O With	Req. 10M-00, -13 or -16; 25A-00; 25G-01 or -02; 26E-01, -02, -03 or -04; 28O-04		2 181 152
26D	ACCELERATOR POSITION SENSOR			
-00	S Without		Prepared for non-Scania throttle when base system is ordered.	
-01	O Sensor with cable 2m	Req. 10M-00, -13 or -16; 26C-01; 28P-01		1 364 185
-02	O Sensor with cable 8m	Req. 10M-00, -13 or -16; 26C-01; 28P-01		1 364 185



Ref	Description	Requirements	Remark	Drw No
26E	CABLE LENGTH BETWEEN MSB AND CBC			
-00	S Without	Req. 26C-00		
-01	O Cable length 2m	Req. 10M-00, -13 or -16; 26C-01		
-02	O Cable length 8m	Req. 10M-00, -13 or -16; 26C-01		
-03	O Cable length 12m	Req. 10M-00, -13 or -16; 26C-01		
-04	O Cable length 24m	Req. 10M-00, -13 or -16; 26C-01		
26F	CONTROL PANEL			
-00	S Without			
-03	O With, one panel	Req. 10M-00, -13 or -16; 26C-01		2 014 191
-04	O With, one panel with cover	Req. 10M-00, -13 or -16; 26C-01		2 014 191
26G	INSTRUMENT PANEL			
-00	S Without			
-01	O With, 2-pole	Req. 10M-00, -13 or -16; 26C-01		2 013 194
-02	O With cover, 2-pole	Req. 10M-00, -13 or -16; 26C-01		2 013 194
26H	SCANIA EMS DISPLAY			
<i>The EMS display is used to read out data, for example fuel consumption and configure specific parameters in the Engine Management System, for example alarm levels. The information is presented in an LCD display. It is also possible to read fault codes via the EMS display.</i>				
-00	S Without			
-01	O Instrument panel, 2-pole. Including cable harness to CBC, 3m	Req. 10M-00, -13 or -16; 26C-01		1 761 984
26J	REMOTE CONTROL BOX			
<i>The remote control box contains a switch for 'remote'/'local' operation, in 'local' mode the engine can't be remotely started. This is a safety feature.</i>				
-00	S Without			
-01	O With cable, length 4m	Req. 10M-00, -13 or -16; 26C-01		1 902 912



Ref	Description	Requirements	Remark	Drw No
SCANIA INSTRUMENTATION 2.0				
Scania Instrumentation 2.0 is a new electrical system with two levels - without or with type approval. All 2.0 options have a family code that starts with 27. Note! Options that have codes that start with 27 are <u>not</u> possible to combine with options that have codes that starts with 26.				
27C BASE SYSTEM 2.0				
Includes: • Main Supply Box, MSB: fuses, diodes and relays • Main Control Display, MCD: coordinator and 5.7" colour touch screen (to view engine data and control the engine). Must be located in engine room when type approved. • 3 or 6 m cable to engine Cable between MSB and MCD is ordered separately (ref.code 27E).				
-00	S Without			
-01	O With 3 m cable	Req. 10M-00 or 27M-01 Req. 26C-00		2 135 526
-02	O With 6 m cable	Req. 10M-00 or 27M-01 Req. 26C-00		2 135 526
27D ACCELERATOR POSITION SENSOR				
-00	S Without			
-01	O With	Not with 27C-00 Req. 28O-04 or -05	Only compatible with redundant throttle on the ECU	1 364 185
27E CABLE LENGTH BETWEEN MSB AND MCD				
-00	S Without	Req. 27C-00		
-01	O Cable length 3 m	Req. 27C-01 or -02		2 135 526
-02	O Cable length 6 m	Req. 27C-01 or -02		2 135 526
-04	O Cable length 12 m	Req. 27C-01 or -02	Cable length 12, 26 and 46 m is only available if not type approved/not with 27M-01.	2 135 526
-08	O Cable length 26 m	Req. 27C-01 or -02		2 135 526
-10	O Cable length 46 m	Req. 27C-01 or -02		2 135 526
27F CONTROL PANEL				
Includes start key, engine speed switches and 2 m cable. Can be connected to the Main Control Display (MCD) or to an Extra Control Display (ECD).				
-00	S Without			
-01	O 1 set incl. 2 m cable	Req. 27C-01 or -02		2 095 987
-02	O 1 set incl. 2 m cable with cover	Req. 27C-01 or -02		2 095 987
-03	O 2 sets incl. 2 m cable	Req. 27C-01 or -02 Not with 27G-00		2 095 987
-04	O 2 sets incl. 2 m cable with cover	Req. 27C-01 or -02 Not with 27G-00		2 095 987
-05	O 3 sets incl. 2 m cable	Req. 27C-01 or -02 Not with 27G-00 or -01		2 095 987
-06	O 3 sets incl. 2 m cable with cover	Req. 27C-01 or -02 Not with 27G-00 or -01		2 095 987



Ref	Description	Requirements	Remark	Drw No
27G	EXTRA CONTROL DISPLAY (ECD)			
	<i>5.7" colour touch screen. Connected to the Main Control Display (MCD) by an Ethernet cable. Cables to MCD and ECD-switch are ordered separately (ref. codes 27H/J/K/L).</i>			
-00	S Without	Req. 27H-00, 27J-00, 27K-00 and 27L-00		
-01	O 1 display	Req. 27C-01 or -02, 27H-00, 27K-00 and 27L-00 Not with 27J-00		2 077 118
-02	O 2 displays	Req. 27C-01 or -02 and 27L-00 Not with 27H-00, 27J-00 or 27K-00	Including switch (connected between MCD and ECD)	2 077 118
-03	O 3 displays	Req. 27C-01 or -02 Not with 27H-00, 27J-00, 27K-00 or 27L-00	Including switch (connected between MCD and ECD)	2 077 118
27H	CABLE LENGTH BETWEEN MCD AND ECD-SWITCH			
-00	S Without			
-01	O 10 m			2 135 526
-02	O 20 m			2 135 526
-03	O 50 m			2 135 526
27J	CABLE LENGTH TO EXTRA CONTROL DISPLAY (ECD) 1			
-00	S Without			
-01	O 10 m			2 135 526
-02	O 20 m			2 135 526
-03	O 50 m			2 135 526
27K	CABLE LENGTH TO EXTRA CONTROL DISPLAY (ECD) 2			
-00	S Without			
-01	O 10 m			2 135 526
-02	O 20 m			2 135 526
-03	O 50 m			2 135 526
27L	CABLE LENGTH TO EXTRA CONTROL DISPLAY (ECD) 3			
-00	S Without			
-01	O 10 m			2 135 526
-02	O 20 m			2 135 526
-03	O 50 m			2 135 526
27M	TYPE APPROVED INSTRUMENTATION			
	<i>Includes Safety Device Unit (SDU), which must be located in engine room, and sensors for oil, water and fuel pressure, water temperature and engine speed. The SDU and sensors are configured with an engine shutdown function. Cables to MSB and engine are ordered separately (ref. codes 27N/P).</i>			
-00	S Without	Req. 27N-00 and 27P-00		
-01	O With	Req. 27C-01 or -02 Req. 27E-01 or -02 Not with 27N-00 or 27P-00	<u>Note!</u> Type approved by DNV. Only approved for multiple installations.	2 135 526
27N	CABLE LENGTH BETWEEN MSB AND SDU			
-00	S Without			
-01	O 3 m		<u>Note!</u> Type approved by DNV.	2 135 526
-02	O 6 m		<u>Note!</u> Type approved by DNV.	2 135 526



Ref	Description	Requirements	Remark	Drw No
27P CABLE LENGTH BETWEEN ENGINE AND SDU				
-00	S Without			
-01	O 3 m		Note! Type approved by DNV.	2 135 526
-02	O 6 m		Note! Type approved by DNV.	2 135 526
28A REGULATOR TYPE (EMS parameter setting)				
-01	S RQV Governor (default value)		Note! The accelerator position sensor controls the engine with possible droop. Common for most applications.	
-02	O RQ Governor	Req 28G-00	Note! The accelerator position sensor controls the engine torque/power.	
28B ENGINE TEMP. REACTION (EMS parameter setting)				
<i>High engine temp reaction, 28B-03 to -06, is recommended in applications where the engine is remotely operated</i>				
-01	S Only alarm (default value)		Note!	
-02	O Torque reduction on low limit		• For a classified engine: see applicable classification rules for the intended application.	
-03	O Engine stop on high limit		• Alarm is always included regardless of option.	
-04	O Engine stop on high limit and torque reduction on low limit		• Override possibility refer to engine stop only, not torque reduction	
-05	O Engine stop on high limit (with override possibility)			
-06	O Engine stop on high limit (with override possibility) and torque reduction on low limit			
28C TEMP. LIMIT HIGH (EMS parameter setting)				
<i>This temp. limit decides the engine temp HIGH alarm limit that are described in 28B-.</i>				
-01	O 98°C			
-02	O 100°C			
-03	O 102°C			
-04	O 103°C			
-05	O 104°C			
-06	S 105°C (default value)			
28D TEMP. LIMIT LOW (EMS parameter setting)				
<i>This temp. limit decides the engine temp LOW alarm limit that are described in 28B-.</i>				
-01	S 95°C (default value)			
-02	O 98°C			
-03	O 100°C	Not with 28C-01		
-04	O 103°C	Not with 28C-01, -02 or -03		
28E LOW OIL PRESSURE REACTION (EMS parameter setting)				
<i>Low oil pressure reaction -03 or -04 is recommended in applications where the engine is remotely operated.</i>				
-01	S Only alarm (default value)		Note! For a classified engine: see applicable classification rules for the intended application.	
-02	O Torque reduction, ~30%			
-03	O Engine stop			
-04	O Engine stop with override			



Ref	Description	Requirements	Remark	Drw No
28F	LOW COOLANT LEVEL REACTION (EMS parameter setting)			
Low coolant level reaction -03 or -04 is recommended in applications where the engine is remotely operated. The option is only valid for engines with coolant level sensor, option 25C.				
-00	S Without	Req. 25C-00	Note! For a classified engine: see applicable classification rules for the intended application.	
-01	O Only alarm (default value if 25C-01)	Req. 25C-01		
-02	O Torque reduction, ~30%	Req. 25C-01		
-03	O Engine stop	Req. 25C-01		
-04	O Engine stop with override	Req. 25C-01		
28G	DROOP SETTING (EMS parameter setting)			
Standard setting is recommended for propulsion application, for auxiliary engines powering for example hydraulic pumps the stiff droop is recommended.				
-00	O Without	Req. 28A-02	Note! Speed droop is a concept that describes the change in speed that takes place when loading the engine or when the load is removed.	
-02	S Stiff			
28L	LIMITED HIGH IDLE WHEN COLD ENGINE (EMS parameter setting)			
This function limits the engine speed when the engine is cold, it takes approx 30 seconds before the engine can be revved more than 1000rpm.				
-00	S Without (default value)			
-01	O With			
28M	HIGH IDLE SPEED OFFSET (EMS parameter setting)			
-01	O 4%		Note! Max engine speed is not allowed to exceed 2450 rpm	
-02	O 6%			
-03	O 8%		Example: Engine factory rating + High idle speed offset = Max engine speed 1800 rpm + 16% = 1800 + 288 = 2088 rpm	
-04	S 10% (default value)	Not for engine speed 2300 rpm		
-05	O 12%	Not for engine speed 2300 rpm		
-06	O 14%	Not for engine speed 2300 rpm		
-07	O 16%	Not for engine speed 2300 rpm		
28N	LOW IDLE SPEED (EMS parameter setting)			
The low idle speed is set at such a level that resonance frequencies (critical speeds) in the powertrain are avoided.				
-01	O 500 rpm			
-02	O 550 rpm			
-03	O 600 rpm			
-04	S 650 rpm (default value)			
-05	O 700 rpm			
-06	O 750 rpm			
-07	O 800 rpm			
-08	O 850 rpm			
-09	O 900 rpm			
-10	O 950 rpm			
-11	O 1000 rpm			
-12	O 1050 rpm			



Ref	Description	Requirements	Remark	Drw No
280	LIMP HOME (EMS parameter setting)			
<i>Important to consider: Is there a risk for injuries of personnel or damages to equipment if the engine runs out of control?</i>				
-01	O Low idle		Settings for how the engine should operate permanently or react due to defect acc. pedal signal or interrupted CAN communication. Note! Ref. 280-04/05 are intended for customers who wish to connect their own redundant/analogue throttle control directly to the EMS or to engine interface C4002.	
-02	S Incremented low idle ~800 rpm (default value)			
-03	O Shut-off due to CAN defect			
-04	O Redundant throttle (limp home)			
-05	O Redundant throttle always active	Req. 28P-00		
28S	HIGH CHARGE TEMP REACTION			
<i>High charge temp reaction 28S-03 to -06 is recommended in applications where the engine is remotely operated.</i>				
-01	S Only alarm		Note! • For a classified engine: see applicable classification rules for the intended application. • Alarm is always included regardless of option. • Override possibility refer to engine stop only, not torque reduction	
-02	O Torque reduction on low limit			
-03	O Engine stop on high limit			
-04	O Engine stop on high limit and torque reduction on low limit			
-05	O Engine stop on high limit (with override possibility)			
-06	O Engine stop on high limit (with override possibility) and torque reduction on low limit			
45	FLYWHEEL			
-01	S SAE 14			1 925 825
46	FLYWHEEL HOUSING			
-01	S SAE1 flange			1 925 826



Ref	Description	Requirements	Remark	Drw No
49	ENGINE BRACKET			
<i>Main factors to consider when selecting engine suspension are installation height of the engine and forces applied to the engine and driven equipment due to operating conditions. For further information please see the Installation manual.</i> <i>All engine suspensions are available with:</i> - Front-mounted brackets - Front- and rear-mounted brackets or - Front-mounted brackets and prepared for rear-mounted brackets, which means that the surface on the flywheel housing intended for rear-mounted brackets is unpainted.				
-01 S	Fixed low 120 mm below the crankshaft		Front-mounted brackets	1 927 370
-01Z O	Fixed low 120 mm below the crankshaft		Front-mounted brackets. Prepared for rear-mounted brackets.	1 927 370
-02 O	Fixed low 120 mm below the crankshaft		Front- and rear-mounted bracket	1 927 370
-03 O	Power pack type 230 mm below the crankshaft	Req. 78A-00	Front-mounted brackets	1 927 370
-03Z O	Power pack type 230 mm below the crankshaft	Req. 78A-00	Front-mounted brackets. Prepared for rear-mounted brackets.	1 927 370
-04 O	Power pack type 230 mm below the crankshaft	Req. 78A-00	Front- and rear-mounted brackets	1 927 370
-09 O	Fixed extra low 25 mm above the crankshaft		Front-mounted brackets	2 017 566
-09Z O	Fixed extra low 25 mm above the crankshaft		Front-mounted brackets. Prepared for rear-mounted brackets.	2 017 566
-10 O	Fixed extra low 25 mm above the crankshaft		Front- and rear-mounted bracket Note! Only for engines with heat exchanger	2 017 566
-11 O	For repowering of P96 DI16 120 mm below the crankshaft		Front-mounted brackets	2 017 566
-11Z O	For repowering of P96 DI16 120 mm below the crankshaft		Front-mounted brackets. Prepared for rear-mounted brackets.	2 017 566
-12 O	For repowering of P96 DI16 120 mm below the crankshaft		Front- and rear-mounted bracket	2 017 566
49A	ENGINE SUSPENSION			
-00 S	Without			
-01 O	Stiff rubber suspension	Not with 49-02/04/10 or -12	Front	1 918 804
-02 O	Stiff rubber suspension	Req. 49-02,-04, -10 or -12	Front and rear	1 918 804
51	AIR CLEANER			
<i>The selection of air cleaner is dependent on the concentration of dust in the air that surrounds the engine. Light duty is suitable for applications working in low dust environment, ocean going. Medium duty is suitable for applications in dusty environments like river boats where dust from land easily can be carried to the vessel.</i>				
-00 S	Without			
-13 O	2 x medium duty Ø13" with safety cartridge		Separately. Without hose.	1 819 176
-14 O	2 x light duty Ø8"		Mounted on turbo charger, pointing forward	1 529 410



Ref	Description	Requirements	Remark	Drw No
56	EXHAUST BEND			
-01	S Without, but with turbo-mounted flange	Req. 57-00		2 065 761
-03	O 2 x 90° bend (dry)	Req. 57-10, -11, -13 or -14		2 065 761
-04	O 2 x water cooled exhaust bends	Req. 57-00	Note! Only for engines with heat exchanger	2 065 761

57	EXHAUST FITTINGS			
-00	S Without			
-10	O Flange, 2 x Ø114 mm			2 065 761
-11	O Flange, 2 x Ø130 mm			2 065 761
-13	O Compensator and flange, 2 x Ø114 mm			2 065 761
-14	O Compensator and flange, 2 x Ø130 mm			2 065 761

60	OIL SUMP			
-01	S Deep front oil sump			1 825 009
-03	O Low oil sump with ladder frame	Req. 25H-00		1 825 009

60A	OIL DIPSTICK			
-01	S Front of engine			2 103 570

60B	ENGINE OIL, FACTORY FILLED			
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The engine can be delivered with factory filled engine oil. This option is suitable for customers that are interested in reducing or eliminating the handling of oil in their production process.

Engine oil: Scania LDF-3. Viscosity class: 10W-40. Outside temperature: -20°C - >+30°C.

-00	S Without			
-01	O For deep oil sump	Req. 60-01		
-02	O For low oil sump	Req. 60-03		

61	OIL FILLER			
-01	S In valve cover			2 103 570

62	OIL DRAINING			
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The selection of oil draining is dependent on the installation. Especially critical is the space available below and next to the oil drain plug. If space for a drain bucket is available, then the standard oil plug is preferred as a simple solution. The hand pump, or electrical pump, is used if the oil is drained to a level above the engine.

-01	S With plug			1 825 009
-03A	O With hand pump and 3-way cock on right hand side			1 825 226
-04A	O With hand pump and 3-way cock on left hand side			1 825 226
-05	O With electric pump and 3-way cock on right hand side		Delivered loose	1 407 848
-06	O With electric pump and 3-way cock on left hand side		Delivered loose	1 407 848

65	CRANKSHAFT			
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The crankshaft is a part subject to special requirements regarding traceability by the class societies. For approval by specific class societies this might be a requirement, to be checked with the class society.

-01	S Not classified			
-02	O With material certificate			
-03	O Classified by Lloyds Register			



Ref	Description	Requirements	Remark	Drw No
78	SEA WATER PUMP			
<i>The self-priming centrifugal seawater pump is suitable for operations in water containing large amounts of sand, mud or solids. The self-priming pump can withstand to be run without water for a short period. Typical operations are river boats in muddy water and rescue boats that may have to enter the shore during operation.</i>				
-00	S Without		Note! Only for engines with keel cooling	
-01	S With		Note! Only for engines with heat exchanger	
-02	O With connection hoses		Note! Only for engines with heat exchanger	2 254 367
-03	O With connection tubes		Note! Only for engines with heat exchanger	2 254 367
-11	O Self-priming centrifugal pump		Note! Only for engines with heat exchanger	1 934 597
-12	O Self-priming centrifugal pump with tube connection to pump and hose connection to heat exchanger		Note! Only for engines with heat exchanger	
-13	O Self-priming centrifugal pump with tube connection		Note! Only for engines with heat exchanger	
78A	BILGE PUMP			
-00	S Without			
-01	O With 2" connection	Req. 90-00		2 108 801
90	FRONT-MOUNTED POWER TAKE-OFF (PTO)			
<i>A front-mounted PTO is suitable for applications that need high torques, for example large auxiliary pumps and air compressors. Normally the driven equipment is mounted separate from the engine.</i>				
-00	S Without			
-01	O Stub shaft for connection of flexible coupling		Note! Max torque 800Nm	1 883 995
-02	O Crankshaft pulley with two extra grooves, Ø260 mm			1 883 995
-04	O Crankshaft pulley with three extra grooves, Ø260 mm			1 883 995
-05	O Stub shaft for connection of flexible coupling with crankshaft pulley with three extra grooves, Ø260 mm.			1 883 995
91	SIDE-MOUNTED POWER TAKE-OFF (PTO)			
<i>A side-mounted PTO is used for low rated engine-mounted hydraulic pumps or compressors.</i>				
-00	S Without			
-01	O Prepared for SAE B, rear-mounted			
-02	O SAE B, 2-hole with shaft SAE B. Gear ratio 1:1.19, clockwise rotation. Rear-mounted.			1 507 581
93	HYDRAULIC PUMP			
-00	S Without			
-01	O Capacity 16 l/min at 170 bar intermittent, 25-30 bar continuous		Note! Without pressure reduction valve	1 457 713
-02	O Capacity 25 l/min at 170 bar intermittent, 25-30 bar continuous		Note! Without pressure reduction valve	1 457 713



Ref	Description	Requirements	Remark	Drw No
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96A MARINE TRANSMISSION CONNECTION PARTS

This option includes water pipe between engine and transmission oil cooler.

This option requires Marine Transmission from factory (S-order).

-00	S	Without		
-01	O	Mounting parts for MG-5135 A	Req. 96C-01. Not with 56-04. Req. 78-01 or -11.	Note! Only for engines with heat exchanger
-02	O	Mounting parts for MGX-5135 A	Req. 96C-01. Not with 56-04. Req. 78-01 or -11.	Note! Only for engines with heat exchanger
-03	O	Mounting parts for MG-5135 SC	Req. 96C-01. Not with 56-04. Req. 78-01 or -11.	Note! Only for engines with heat exchanger
-04	O	Mounting parts for MGX-5135 SC	Req. 96C-01. Not with 56-04. Req. 78-01 or -11.	Note! Only for engines with heat exchanger
-05	O	Mounting parts for MG-5145 A	Req. 96C-01. Not with 56-04. Req. 78-01 or -11.	Note! Only for engines with heat exchanger
-06	O	Mounting parts for MGX-5145 A	Req. 96C-01. Not with 56-04. Req. 78-01 or -11.	Note! Only for engines with heat exchanger
-07	O	Mounting parts for MG-5145 SC	Req. 96C-01. Not with 56-04. Req. 78-01 or -11.	Note! Only for engines with heat exchanger
-08	O	Mounting parts for MGX-5145 SC	Req. 96C-01. Not with 56-04. Req. 78-01 or -11.	Note! Only for engines with heat exchanger

96B MARINE TRANSMISSION SUSPENSION

This option requires Marine Transmission from factory (S-order).

-00	S	Without		
-01	O	Fixed suspension for MG/MGX-5135 A / SC	Req. 49-01, -01Z, -02, -11, Note! Only for engines with heat exchanger -11Z or -12	
-02	O	Stiff rubber suspension for MG/MGX-5135 A / SC	Req. 49-01, -01Z, -02, -11, Note! Only for engines with heat exchanger -11Z or -12 Req. 49A-01 or -02	
-03	O	Fixed suspension for MG/MGX-5145 A / SC	Req. 49-01, -01Z, -02, -11, Note! Only for engines with heat exchanger -11Z or -12	
-04	O	Stiff rubber suspension for MG/MGX-5145 A / SC	Req. 49-01, -01Z, -02, -11, Note! Only for engines with heat exchanger -11Z or -12 Req. 49A-01 or -02	

96C STUDS IN FLYWHEEL HOUSING

-00	S	Without
-01	O	With

98C FUEL PRE-FILTER

Fuel pre-filter is required for all Scania marine engines. Water will condensate in the tank and enter the fuel, thus a risk of engine disturbances. The fuel pre-filter separates water from the fuel. The option without is valid for customers who uses a non-Scania pre-filter.

-00	O	Without	Note! 98C-00 requires a water separating pre-filter from an external manufacturer. If no filter is mounted the engine warranty is not valid.	
-01	S	Single fuel filter with water separator	Req. 10M-00 Note! Not type approved by any classification society.	1 774 501
-03	O	Reversible dual fuel filter with water separator	Note! Type approved by ABS and BV.	1 769 500



Ref	Description	Requirements	Remark	Drw No
98D	CAB HEATER			
-00	S Without			
-01	O Prepared for cab heater connection		Pipe outer Ø22 mm, hose inner Ø20 mm	
99G	PAINTWORK			
-01	S Orange heavy duty quality / silver on warm parts			
99L	CRANKCASE VENTILATION			
-01	S Closed ventilation			2 017 567
99P	OPERATOR'S MANUAL			
-00	O Without		Note! If a preferred language is not specified when ordering, the operator's manual will be delivered in English. Available languages are: Chinese (simplified), Chinese (trad.), Czech, Danish, Dutch, English, Finnish, French, German, Italian, Japanese, Korean, Norwegian, Polish, Portuguese, Russian, Spanish and Swedish	
-01	S 1 copy			
-02	O 2 copies			
-03	O 3 copies			
99Q	SPARE PARTS CATALOGUE			
-00	S Without			
-01	O 1 copy			
-02	O 2 copies			
-03	O 3 copies			
99T	FUEL MAIN FILTER			
<i>Reversible fuel filters enable the switching of fuel filters during operation. This is required by classification societies in many applications.</i>				
-00	S Single fuel filter			
-01	O Reversible dual fuel filter		Note! Approved for classification.	
99U	FUEL HOSES			
-00	O Without			
-01	S With nipples		For hose, inner Ø9 mm	
-02	O With two fuel hoses		For connection to pipe, outer Ø12 mm	



6 ENGINE DATA

16-series

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General information

Standard equipment

Scania Engine Management System, EMS

Unit injectors, PDE

Twin turbochargers, heat insulated

Water-cooled charge air cooler

Fuel pre-filter with water separator

Fuel filter

Oil filter, full flow

Centrifugal oil cleaner

Oil cooler, integrated in block

Oil filler, in valve cover

Oil draining with plug

Oil dipstick, in block

Deep front oil sump

Starter, 2-pole, 7.0 kW, (EMS controlled)

Alternator 2-pole, 100A

Flywheel SAE 14

Silumin flywheel housing, SAE1 flange

Front-mounted engine brackets

Catwalk and cover for belt transmission

Sea water charge air cooler (engines with heat exchanger only)

Sea water pump (engines with heat exchanger only)

Dual heat exchangers (engines with heat exchanger only)

Closed crankcase ventilation

Operator's manual

For optional equipment, see 'Equipment list'.

Note! No optional equipment is type approved for classification if not otherwise stated.

Ratings

PRP, Prime power For continuous operation and unlimited yearly operation at varying load. Max. mean load factor of 70% of rated power over 24 h of operation.
1 hour/12 hours period of accumulated peak overload to 110%.

Power definition acc. to ISO 8528.

Power test codes: ISO 3046, ISO 8528, DIN 6280 Dauerbetrieb.

Emission compliance and classification

For detailed information about approved and certified engines and classification society approvals, access SAIL at <http://sail.scania.com> to view or download the appropriate certificate.

Dual speed configuration

The engine speed can be switched between 1500 rpm (50 Hz) and 1800 rpm (60 Hz) via the Coordinator/EMS.

Note! that the default setting is 1500 rpm (50 Hz) from factory.

To manually change the nominal speed, see Electrical systems in the Installation manual or EMS CAN specifications on SAIL at <http://sail.scania.com>.



Engine programme

EU Stage IIIA¹⁾, US Tier 2 and IMO Tier II compliant engines

With heat exchanger

Engine type	PRP 1500 rpm (50 Hz)	PRP 1800 rpm (60 Hz)	Factory order reference sequence			
	kW	kW	Rating	Engine speed	Output	Engine ref.
DI16 074M	430	468	13-03	35-20	12-45	04-01
DI16 074M	450	511	13-03	35-20	12-46	04-02
DI16 074M	480	553	13-03	35-20	12-48	04-03
DI16 074M	511	596	13-03	35-20	12-49	04-04

EU Stage IIIA¹⁾ and IMO Tier II compliant engines

With keel cooling

Engine type	PRP 1500 rpm (50 Hz)	PRP 1800 rpm (60 Hz)	Factory order reference sequence			
	kW	kW	Rating	Engine speed	Output	Engine ref.
DI16 075M	430	468	13-03	35-20	12-45	04-11
DI16 075M	450	511	13-03	35-20	12-46	04-12
DI16 075M	480	553	13-03	35-20	12-48	04-13
DI16 075M	511	596	13-03	35-20	12-49	04-14

6_B

1) EU Stage IIIA only applies for propulsion engines E2 test cycle.



Basic data

General

Configuration and number of cylinders	V 8	
Working principle	4-stroke	
Bore x stroke	130 x 154	mm
Displacement	16.4	dm ³
Compression ratio		
keel cooling	17.4:1	
with heat exchanger	16.7:1	
Firing order	1 - 5 - 4 - 2 - 6 - 3 - 7 - 8	
Piston speed		
at 1500 rpm	7.7	m/s
at 1800 rpm	9.24	m/s
Pistons	Steel pistons	
Camshaft	High position alloy steel	
Connection rods	I-section press forgings of alloy steel	
Crankshaft	Alloy steel with hardened and polished bearing surfaces	
Rotation, seen from flywheel end	Counter clockwise	
Total moment of inertia with flywheel		
SAE 14	3.48	kgm ²
Number of teeth on flywheel ring gear	158	
Weight approx. (excl. oil and coolant)		
with heat exchanger	1670	kg
keel cooling	1600	kg

Lubrication system

Oil capacity (deep front oil sump)		
min	40	dm ³
max	48	dm ³
Oil consumption	<0.3	g/kWh
Oil change intervals	500	h
Oil grade		
engines run on low-sulphur fuel	ACEA E5 or E7	
engines not run on low-sulphur fuel	Total Base Number (TBN) at least 12 (ASTM 2896)	
Oil pressure		
normal	3-6	bar
minimum permitted at idle speed	0.7	bar
Oil temperature		
normal	90-110	°C
Oil cleaner	Centrifugal	
filtration	5-7	Micron
Oil filter	Paper/Full flow	
Oil cooler	Water cooled/Full flow	

Injection system

Type	Unit injectors
Governor	Scania Engine Management System, EMS
Fuel filter	Paper filter element

**Cooling system**

Coolant volume

with heat exchanger	63	dm ³
keel cooling, double circuit	50	dm ³

Coolant temperature

with heat exchanger	86-91	°C
keel cooling	78-83	°C

Number of thermostats

with heat exchanger	2
keel cooling	1

Opening temperature

with heat exchanger	80/87	°C
keel cooling	75	°C

Intake system

Permissible pressure drop in intake system

with cleaned or new filter	30	mbar
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Permissible pressure drop in intake system

with blocked (dirty) filter	65	mbar
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Electrical system

Type	2-pole, 24V, DC
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Starter, standard equipment	2-pole, 24V, 7.0 kW
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Alternator, standard equipment	2-pole, 28V, 100A
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Technical data

DI16 074M, 430-468 kW - With heat exchanger (engine ref. 04-01)

Emission compliance	Fuel injection system	Rating
EU Stage IIIA ¹⁾ , US Tier 2, IMO Tier II	PDE	PRP, Prime power

	Engine speed (rpm)		Unit
	1500	1800	
Gross power	430	468	kW
Gross torque	2737	2483	Nm
Spec. fuel consumption			
full load	199	204	g/kWh
3/4 load	201	204	g/kWh
1/2 load	204	209	g/kWh
Heat rejection			
to coolant	315	360	kW
to exhaust gas	263	297	kW
to surrounding air	20	23	kW
Air consumption	32	42	kg/min
Pressure in intake manifold	1.5	1.7	Bar
Exhaust flow	34	43	kg/min
Exhaust temperature	453	405	°C

1) EU Stage IIIA only applies for propulsion engines with E2 test cycle.



Technical data

DI16 074M, 450-511 kW - With heat exchanger (engine ref. 04-02)

Emission compliance	Fuel injection system	Rating
EU Stage IIIA ¹⁾ , US Tier 2, IMO Tier II	PDE	PRP, Prime power

	Engine speed (rpm)		Unit
	1500	1800	
Gross power	450	511	kW
Gross torque	2865	2711	Nm
Spec. fuel consumption			
full load	198	202	g/kWh
3/4 load	200	203	g/kWh
1/2 load	203	207	g/kWh
Heat rejection			
to coolant	328	386	kW
to exhaust gas	274	320	kW
to surrounding air	21	25	kW
Air consumption	33	43	kg/min
Pressure in intake manifold	1.6	1.8	Bar
Exhaust flow	35	45	kg/min
Exhaust temperature	457	416	°C

1) EU Stage IIIA only applies for propulsion engines with E2 test cycle.



Technical data

DI16 074M, 480-553 kW - With heat exchanger (engine ref. 04-03)

Emission compliance	Fuel injection system	Rating
EU Stage IIIA ¹⁾ , US Tier 2, IMO Tier II	PDE	PRP, Prime power

	Engine speed (rpm)		Unit
	1500	1800	
Gross power	480	553	kW
Gross torque	3056	2934	Nm
Spec. fuel consumption			
full load	198	201	g/kWh
3/4 load	200	203	g/kWh
1/2 load	203	206	g/kWh
Heat rejection			
to coolant	351	416	kW
to exhaust gas	293	346	kW
to surrounding air	23	27	kW
Air consumption	35	45	kg/min
Pressure in intake manifold	1.7	2.0	Bar
Exhaust flow	36	47	kg/min
Exhaust temperature	465	430	°C

1) EU Stage IIIA only applies for propulsion engines with E2 test cycle.



Technical data

DI16 074M, 511-596 kW - With heat exchanger (engine ref. 04-04)

Emission compliance	Fuel injection system	Rating
EU Stage IIIA ¹⁾ , US Tier 2, IMO Tier II	PDE	PRP, Prime power

	Engine speed (rpm)		Unit
	1500	1800	
Gross power	511	596	kW
Gross torque	3253	3162	Nm
Spec. fuel consumption			
full load	199	202	g/kWh
3/4 load	200	204	g/kWh
1/2 load	202	205	g/kWh
Heat rejection			
to coolant	376	449	kW
to exhaust gas	312	376	kW
to surrounding air	24	29	kW
Air consumption	36	47	kg/min
Pressure in intake manifold	1.8	2.1	Bar
Exhaust flow	38	49	kg/min
Exhaust temperature	473	447	°C

1) EU Stage IIIA only applies for propulsion engines with E2 test cycle.



Technical data

DI16 075M, 430-468 kW - With keel cooling, double circuit (engine ref. 04-11)

Emission compliance	Fuel injection system	Rating
EU Stage IIIA ¹⁾ , IMO Tier II	PDE	PRP, Prime power

	Engine speed (rpm)		Unit
	1500	1800	
Gross power	430	468	kW
Gross torque	2737	2483	Nm
Spec. fuel consumption			
full load	201	207	g/kWh
3/4 load	202	207	g/kWh
1/2 load	206	215	g/kWh
Heat rejection			
to main coolant circuit	269	293	kW
to exhaust gas	263	306	kW
to surrounding air	21	23	kW
to charge air cooler circuit	56	78	kW
Coolant flow @ back pressure in water circuit for charge air cooler	205@0.10	205@0.09	dm ³ @bar
Max. water inlet temp. to charge air cooler	40	40	°C
Air consumption	32	42	kg/min
Air temperature			
before charge air cooler	156	171	°C
after charge air cooler	54	60	°C
Pressure in intake manifold	1.6	1.8	Bar
Exhaust flow	34	43	kg/min
Exhaust temperature	452	417	°C

1) EU Stage IIIA only applies for propulsion engines with E2 test cycle.

Technical data

DI16 075M, 450-511 kW - With keel cooling, double circuit (engine ref. 04-12)

Emission compliance	Fuel injection system	Rating
EU Stage IIIA ¹⁾ , IMO Tier II	PDE	PRP, Prime power

	Engine speed (rpm)		Unit
	1500	1800	
Gross power	450	511	kW
Gross torque	2865	2711	Nm
Spec. fuel consumption			
full load	200	206	g/kWh
3/4 load	202	207	g/kWh
1/2 load	205	212	g/kWh
Heat rejection			
to main coolant circuit	278	315	kW
to exhaust gas	274	328	kW
to surrounding air	21	25	kW
to charge air cooler circuit	60	86	kW
Coolant flow @ back pressure in water circuit for charge air cooler	205@0.10	205@0.09	dm ³ @bar
Max. water inlet temp. to charge air cooler	40	40	°C
Air consumption	33	43	kg/min
Air temperature			
before charge air cooler	161	179	°C
after charge air cooler	55	62	°C
Pressure in intake manifold	1.7	1.9	Bar
Exhaust flow	35	45	kg/min
Exhaust temperature	457	427	°C

6_B

1) EU Stage IIIA only applies for propulsion engines with E2 test cycle.



Technical data

DI16 075M, 480-553 kW - With keel cooling, double circuit (engine ref. 04-13)

Emission compliance	Fuel injection system	Rating
EU Stage IIIA ¹⁾ , IMO Tier II	PDE	PRP, Prime power

	Engine speed (rpm)		Unit
	1500	1800	
Gross power	480	553	kW
Gross torque	3056	2934	Nm
Spec. fuel consumption			
full load	200	205	g/kWh
3/4 load	202	207	g/kWh
1/2 load	204	211	g/kWh
Heat rejection			
to main coolant circuit	294	335	kW
to exhaust gas	293	356	kW
to surrounding air	23	27	kW
to charge air cooler circuit	67	94	kW
Coolant flow @ back pressure in water circuit for charge air cooler	205@0.10	205@0.09	dm ³ @bar
Max. water inlet temp. to charge air cooler	40	40	°C
Air consumption	35	45	kg/min
Air temperature			
before charge air cooler	170	188	°C
after charge air cooler	56	64	°C
Pressure in intake manifold	1.8	2.1	Bar
Exhaust flow	36	47	kg/min
Exhaust temperature	464	443	°C

1) EU Stage IIIA only applies for propulsion engines with E2 test cycle.

Technical data

DI16 075M, 511-596 kW - With keel cooling, double circuit (engine ref. 04-14)

Emission compliance	Fuel injection system	Rating
EU Stage IIIA ¹⁾ , IMO Tier II	PDE	PRP, Prime power

	Engine speed (rpm)		Unit
	1500	1800	
Gross power	511	596	kW
Gross torque	3253	3162	Nm
Spec. fuel consumption			
full load	201	206	g/kWh
3/4 load	202	207	g/kWh
1/2 load	204	210	g/kWh
Heat rejection			
to main coolant circuit	312	361	kW
to exhaust gas	315	387	kW
to surrounding air	24	29	kW
to charge air cooler circuit	74	104	kW
Coolant flow @ back pressure in water circuit for charge air cooler	205@0.10	205@0.09	dm ³ @bar
Max. water inlet temp. to charge air cooler	40	40	°C
Air consumption	36	47	kg/min
Air temperature			
before charge air cooler	178	199	°C
after charge air cooler	58	67	°C
Pressure in intake manifold	2.0	2.2	Bar
Exhaust flow	38	49	kg/min
Exhaust temperature	474	459	°C

6B

1) EU Stage IIIA only applies for propulsion engines with E2 test cycle.



Basic dimensions

The basic dimensions are indicated with coordinates. The coordinate system is three dimensional and consists of three planes at straight angles to each other; x, y and z. The dimensions are indicated in mm from crankshaft centre.

DI16 074M - With heat exchanger

- 1 Air intake (Ø 150 mm)

1a	x	-464	1b	x	-464
	y	+543		y	-544
	z	+642		z	+641

- 2 Exhaust outlet (Ø 115 mm)

2a	x	+84	2b	x	+84
	y	+477		y	-478
	z	+576		z	+575

- 3 Sea water inlet (Ø 50 mm)

3	x	+123
	y	-293
	z	+119

- 4 Sea water outlet (Ø 51 mm)

4a	x	-144	4b	x	-92
	y	467		y	-467
	z	+77		z	+77

- 5 Coolant drain

- 6 Fresh water filling

- 7 Fuel inlet
(M18x1.5, with nipples
for hose: inner Ø 9 mm)

7	x	-1165
	y	-452
	z	+199

- 8 Fuel return
(M18x1.5, with nipples
for hose: inner Ø 9 mm)

8	x	-1125
	y	-456
	z	+199

- 9 Oil filling

- 10 Oil dipstick

- 11 Oil drain plug

- 12 Connection from cab heater
(M26x1.5)

12	x	-1041
	y	+544
	z	+280

- 13 Connection to cab heater
(M26x1.5)

13	x	-1092
	y	+364
	z	+83

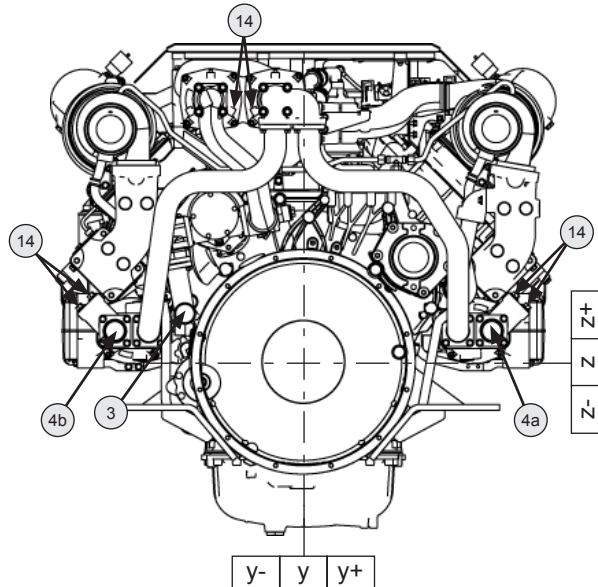
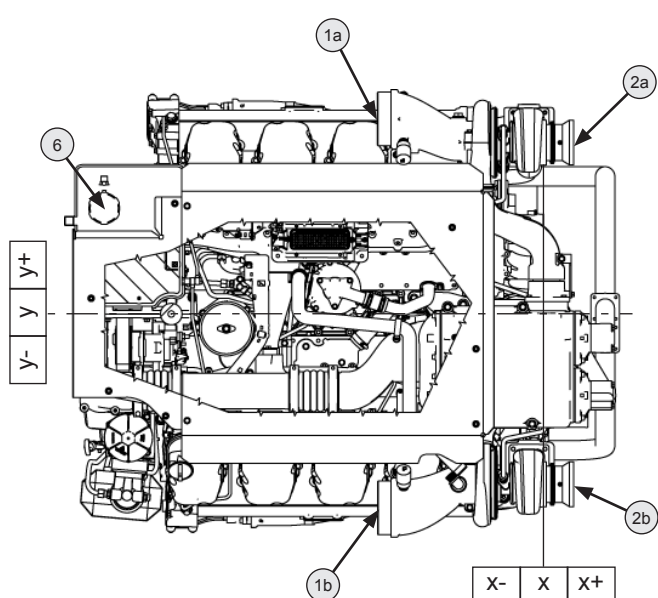
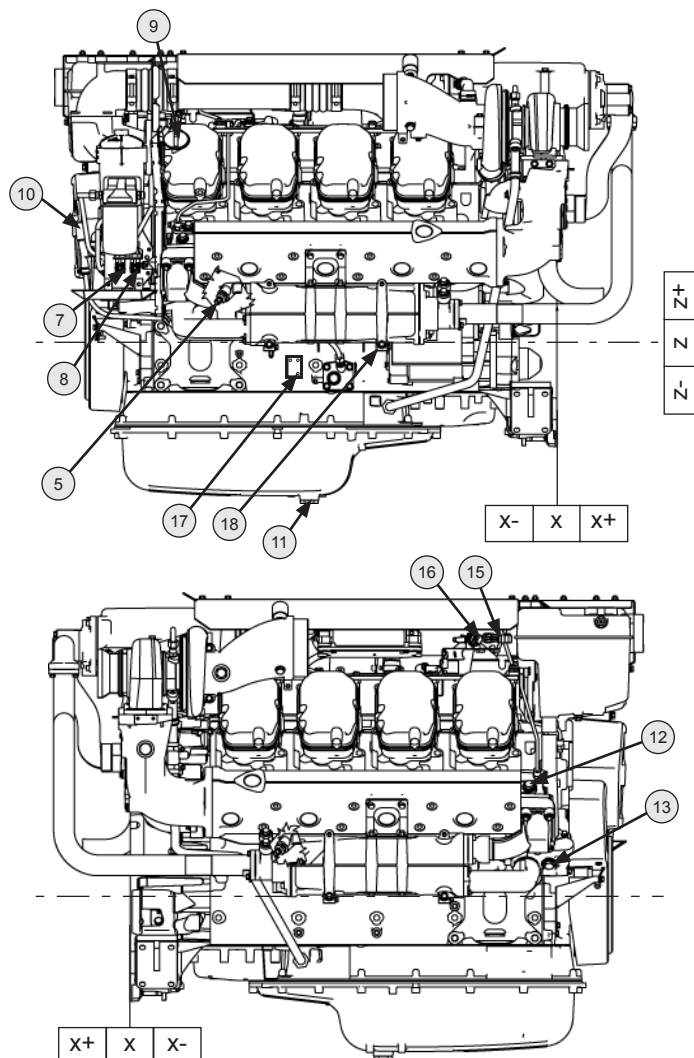
- 14 Sacrificial anode

- 15 Customer interface EMS

- 16 Diagnostic socket

- 17 Battery connection + (M10)

- 18 Battery connection - (M12)



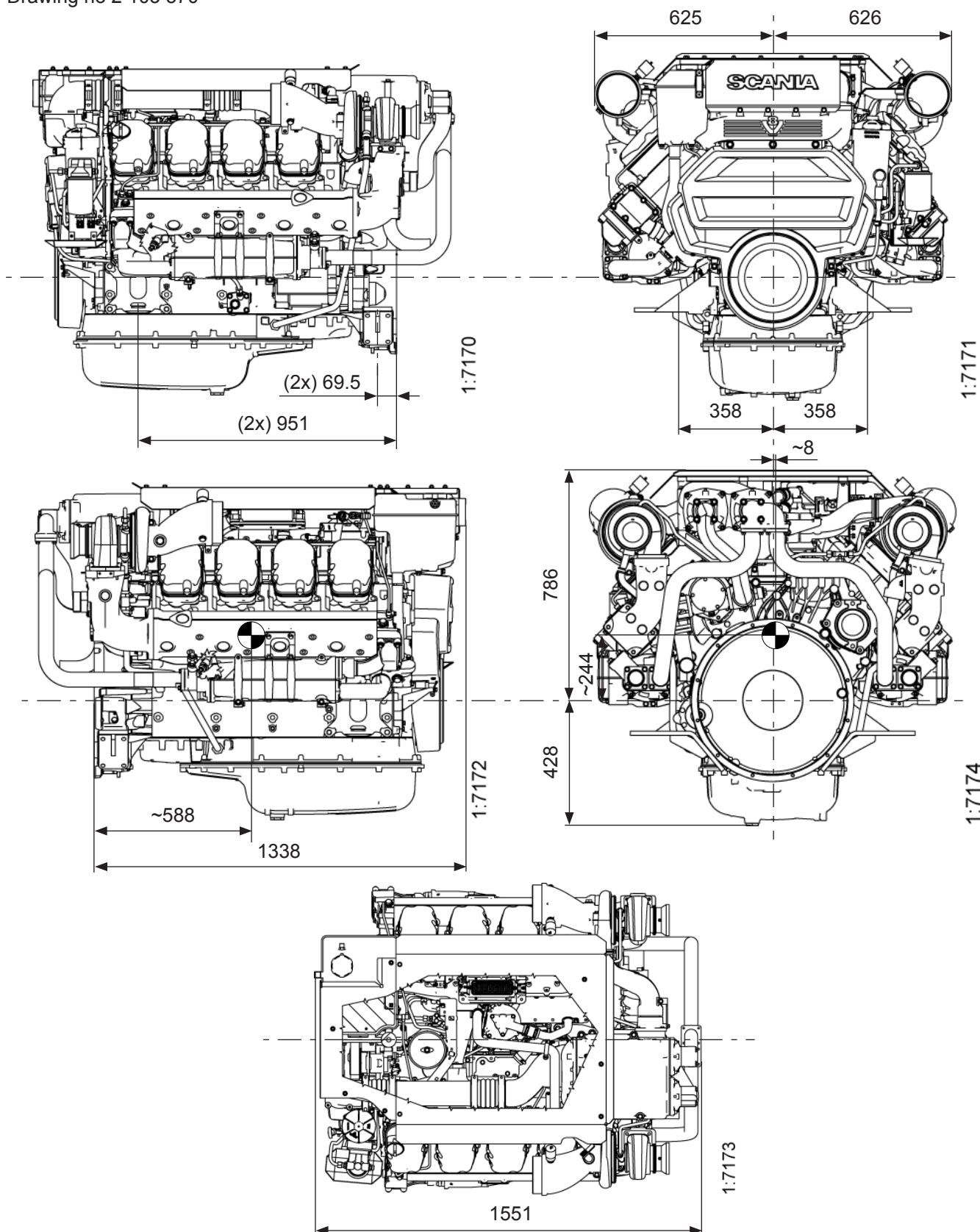


Dimensional drawings

All sketches are only intended as general sales information and must not be used for any installation purposes. The values for centre of gravity applies for engines with standard equipment including coolant. All dimensions are indicated in mm.

DI16 074M - With heat exchanger

Drawing no 2 103 570



6_B



Basic dimensions

The basic dimensions are indicated with coordinates. The coordinate system is three dimensional and consists of three planes at straight angles to each other; x, y and z. The dimensions are indicated in mm from crankshaft centre.

DI16 075M - With keel cooling, double circuit

- 1 Air intake (Ø 150 mm)

1a	x	-464	1b	x	-464
	y	+543		y	-544
	z	+642		z	+641

- 2 Exhaust outlet (Ø 115 mm)

2a	x	+24	2b	x	+24
	y	+477		y	-478
	z	+576		z	+575

- 3 Main coolant inlet (Ø 63 mm)

3	x	-1033
	y	+404
	z	+43

- 4 Main coolant outlet (Ø 63 mm)

4	x	-1124
	y	+566
	z	+180

- 5 Coolant drain

- 6 Coolant bleed pipe (Ø 8 mm)

- 7 Fuel inlet

(M18x1.5, with nipples
for hose: inner Ø 9 mm)

7	x	-1165
	y	-452
	z	+199

- 8 Fuel return

(M18x1.5, with nipples
for hose: inner Ø 9 mm)

8	x	-1125
	y	-456
	z	+199

- 9 Oil filling

- 10 Oil dipstick

- 11 Oil drain plug

- 12 Connection from cab heater
(M26x1.5)

12	x	-1041
	y	+544
	z	+280

- 13 Connection to cab heater
(M26x1.5)

13	x	-1092
	y	+364
	z	+83

- 14 Customer interface EMS

- 15 Diagnostic socket

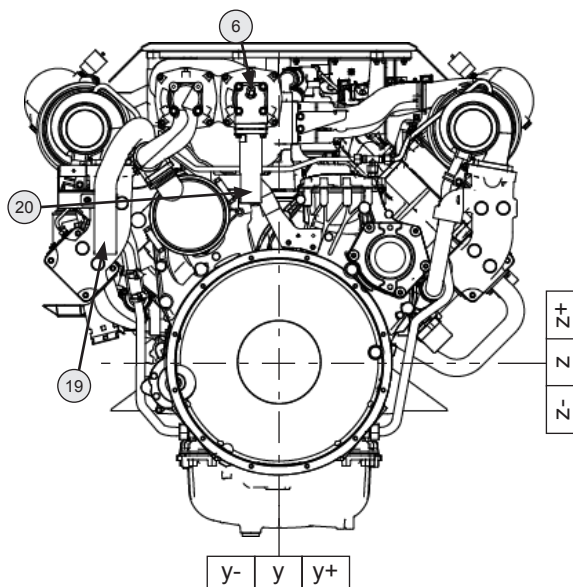
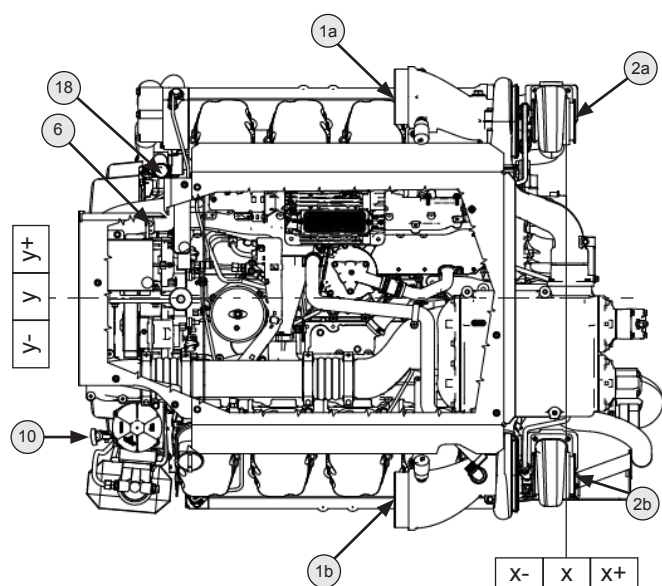
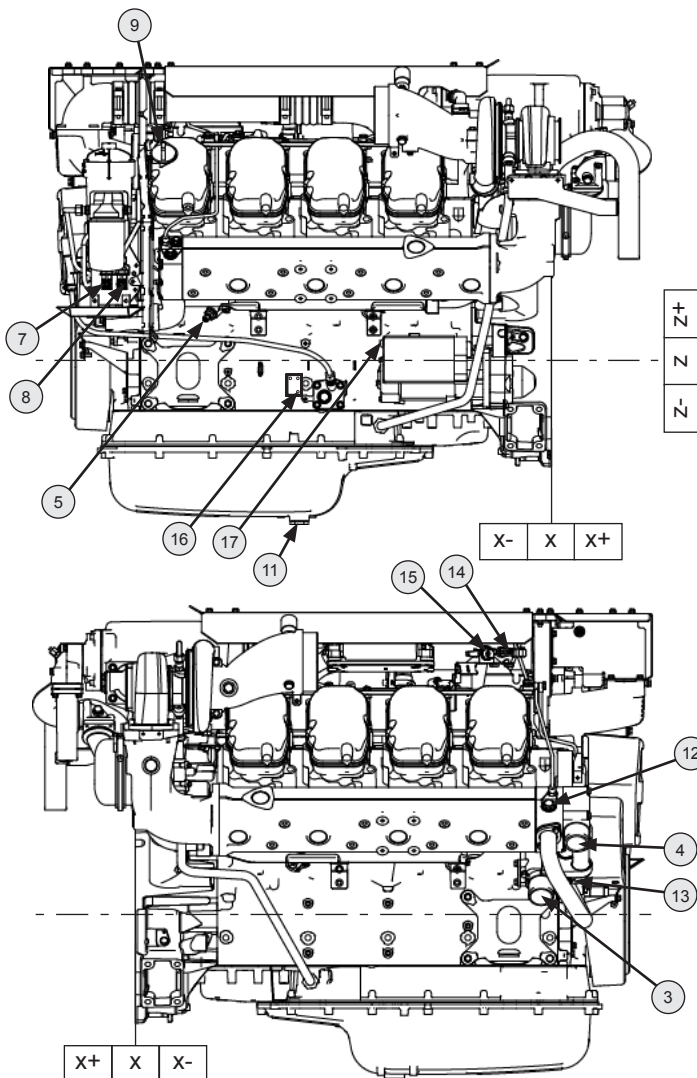
- 16 Battery connection + (M10)

- 17 Battery connection - (M12)

- 18 Static line (Ø 38 mm)

- 19 Coolant inlet from CAC external circuit (Ø 51 mm)

- 20 Coolant outlet to CAC external circuit (Ø 51 mm)



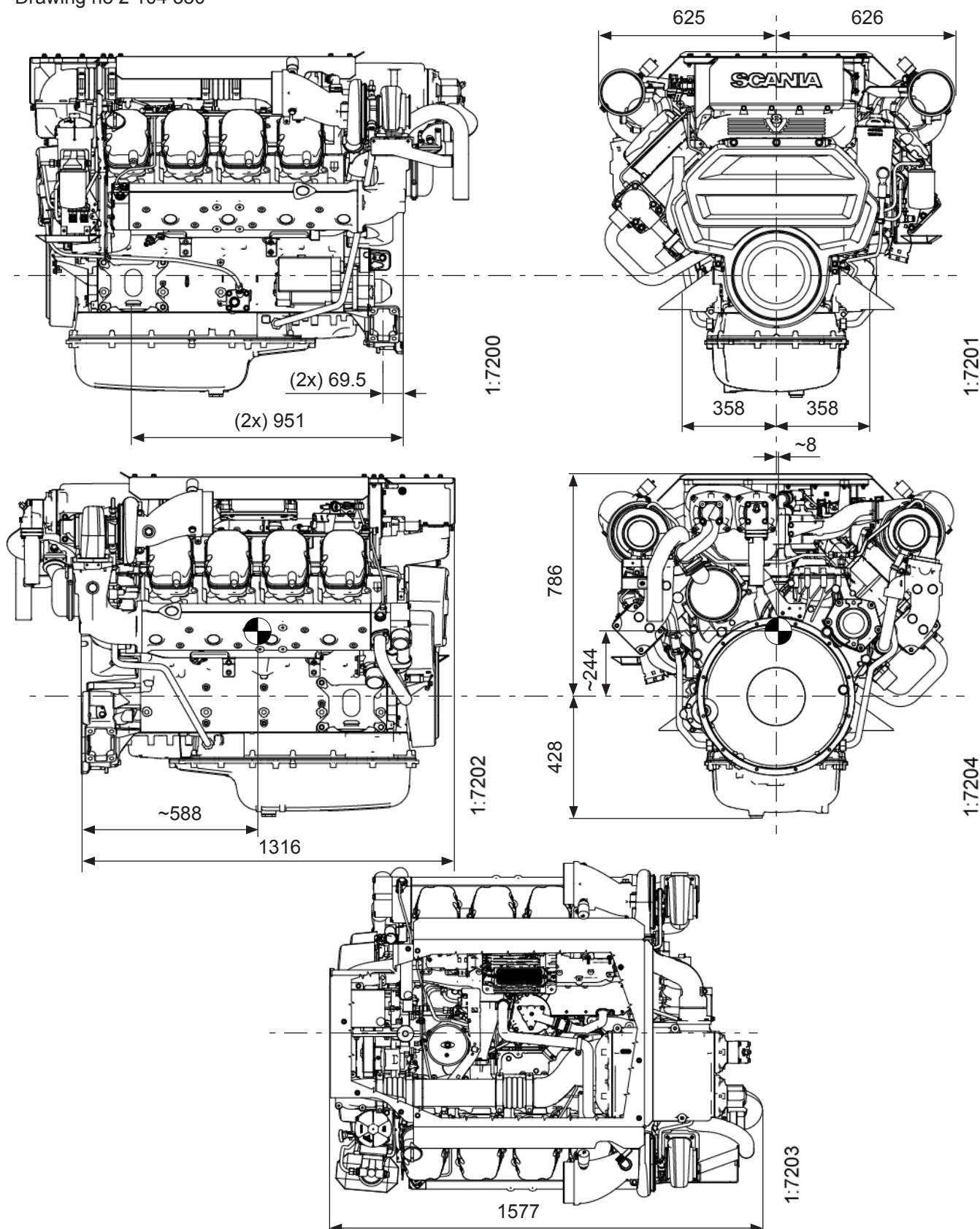


Dimensional drawings

All sketches are only intended as general sales information and must not be used for any installation purposes. The values for centre of gravity applies for engines with standard equipment including coolant. All dimensions are indicated in mm.

DI16 075M - With keel cooling, double circuit

Drawing no 2 104 350

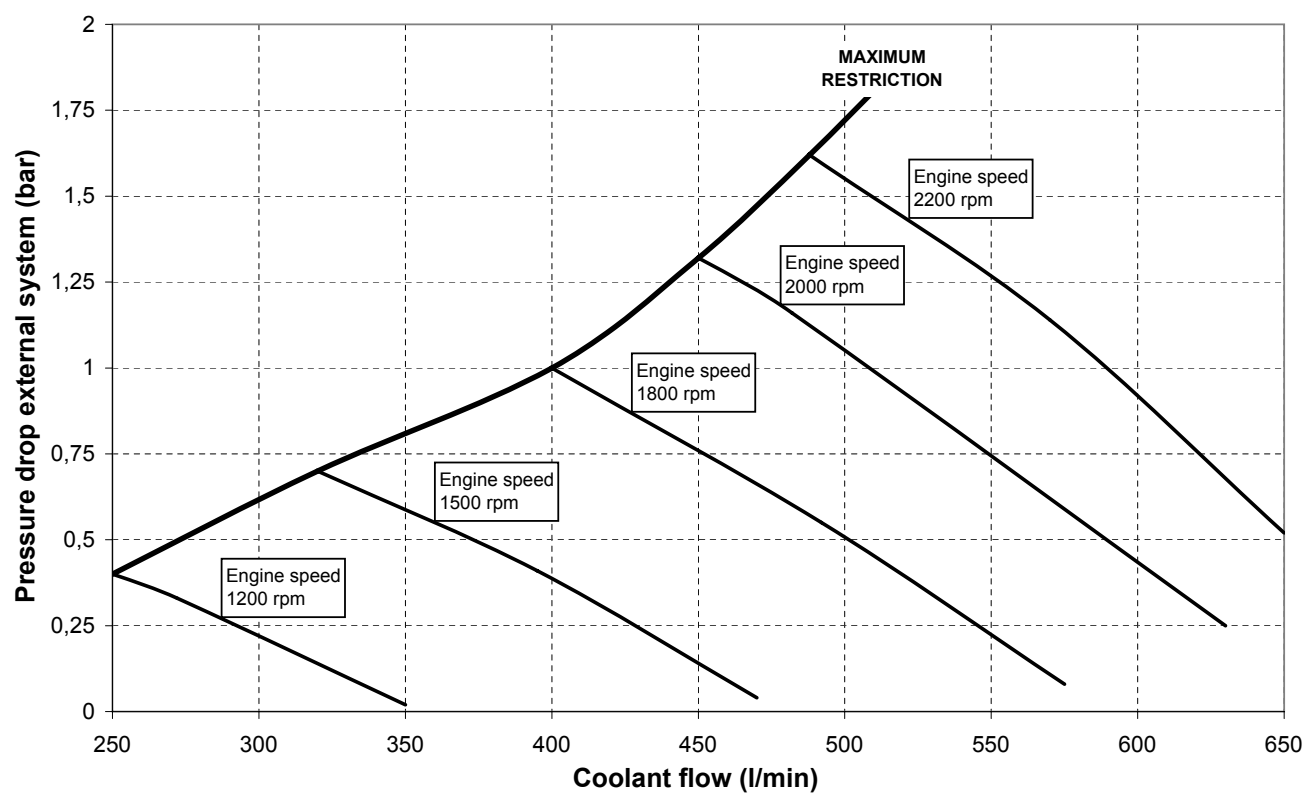


6_B



Coolant flow

The coolant flow depends on the pressure drop in the external system according to the graph below.
Valid for all DI16.





Equipment list

S = Standard

O = Optional

For illustrations and technical data, please see 'Equipment data'.

Drawings referred to in this section are available on Scania's Technical Information Library, TIL, under 'Drawings industrial & marine engines' or can be ordered via Pre-sales FRAS.

Ref	Description	Requirements	Remark	Drw No
10K	TORSIONAL VIBRATION CALCULATIONS			
-00	S Without			
-01	O Single engine installation with 1-3 driven masses. Typical genset or direct driven propeller installations.		Note! TVC can not be ordered directly.	
-02	O Several driven masses both behind and/or in front of the engine. Genset with auxiliary devices, propeller installations with front PTO, propeller installations with marine transmissions.		Torsional vibration calculations must be requested with the TVC form available at https://sail.scania.com and sent to factory for evaluation, before an actual order can be placed.	
-03	O Branched drive train, multi engine (advanced) installations, belt driven units etc.		If a TVC calculation has been rejected, further investigation is possible and will be charged per hour.	
10M	CLASSIFICATION			
	Note! For information about approved engines, access SAIL at http://sail.scania.com .			

-00	S Without		
-01	O ABS: American Bureau of Shipping	Req. 65-03	
-02	O BV: Bureau Veritas	Req. 65-02 or -03	
-03	O DNV: Det Norske Veritas	Req. 65-02 or -03	
-04	O GL: Germanischer Lloyd	Req. 65-02 or -03	
-05	O LR: Lloyds Register	Req. 65-03	
-06	O RINA: Registro Italiano Navale	Req. 65-03	
-11	O SF: Sjöfartsverket		
-12	O RS: Russian Maritime Register of Shipping	Req. 65-02 or -03	
-13	O RRR: Russian River Register		Only prepared for RRR Classification.
-14	O CCS: China Classification Society	Req. 65-02 or -03	
-15	O TL: Türk Loydu	Req. 65-03	
-16	O CRS: Croatian Register of Shipping	Req. 65-02 or -03	



Ref	Description	Requirements	Remark	Drw No
100	TYPE OF IMO CERTIFICATE			
	<i>Note! Ships in Russia: All engines above 130 kW on vessels with flag state Russia, except emergency engines, must have EIAPP certificate issued by Russian Maritime Register of Shipping, 10O-05.</i>			
	<i>Note! Ships in China: All engines above 130 kW on vessels with flag state China, except emergency engines, must have EIAPP certificate issued by China Classification Society, 10O-06.</i>			
	<i>Note! EIAPP for German-flagged vessels will have an additional fee due to extra costs caused by the German Administration.</i>			
-00	S Without			
-01	O EIAPP certificate issued by Germanischer Lloyd - GL			
-02	O S.o.C certificate issued by Germanischer Lloyd - GL			
-05	O EIAPP certificate issued by Russian Maritime Register of Shipping - RS	Req. 10M-12	No EIAPP certificate will be issued if the engine is not classified by RS.	
-06	O EIAPP certificate issued by China Classification Society - CCS	Req. 10M-14	No EIAPP certificate will be issued if the engine is not classified by CCS.	
25A	CONNECTION EMS			
	<i>The connector kit contains pins and connector for connecting to the electrical interface on the engine. The customer will attach the wirings to the connectors himself.</i>			
-01	S With connector kit			
-02	O With cable 6.3 m incl. connector			
25B	OIL TEMP, Integrated oil temp. sensor			
-00	S Without			
-01	O With			
25C	COOLANT LEVEL MONITOR			
	<i>The coolant level monitor is used to ensure that the coolant level is not dropping below a critical level that leaves the temperature sensor in the air. If the temperature sensor is not in contact with the coolant, boiling will not be detected, causing a risk for engine damages. The coolant level monitor is strongly recommended since the engine room is mostly remote operated.</i>			
-00	S Without		Note! Requires a level monitor from an external manufacturer.	
-01	O Level monitor 2-pole, normally closed (when mounted in application)	Req. 28F-01, -02, -03 or -04		
25D	STARTER			
-00	O Without			
-01	S 2-pole, 7 kW, EMS controlled			1 882 043
25E	ALTERNATOR			
	<i>In the selection of an alternator the total electrical consumption must be considered. It is essential that a reserve of electrical power is available in order to avoid voltage drop in the EMS and problems with equipment such as instrumentation and lighting.</i>			
-00	O Without			
-01	S 2-pole, 100A, EMS controlled			1 743 548
-04	O 2-pole, 2 x 100A, EMS controlled			1 743 548



Ref	Description	Requirements	Remark	Drw No
25F	ENGINE HEATER			
<i>The engine heater will ensure that the engine keeps a temperature level above the ambient for easier starting. Since a warm engine have less friction, emission and operates more smoothly due to warm oil it will be more environmental friendly and significantly reduce engine wear. Engine heater 1500W with thermostat is recommended for customers that will use the heater continuously. Engine heater 500W is recommended for installations with insufficient fusing for using 1500W.</i>				
-00	S	Without		
-06	O	1500 W/115 V, plug in with thermostat		2 074 021
-07	O	1500 W/230 V, plug in with thermostat		2 074 021
-08	O	550 W/230 V, plug in with thermostat		2 074 021
-09	O	550 W/115 V, plug in with thermostat		2 074 021
25G	POWER CABLE BETWEEN ALTERNATOR AND STARTER			
<i>The power cable is the feeding cable from the alternator to the starter motor for charging the batteries. The cable is mandatory to have either supplied by Scania or by the customer. The alternator requires constant 24V connected at B+ in order to work correctly.</i>				
-00	O	Without		
-01A	S	With, for single alternator configuration	Req. 25E-01	Note! The power cable is non-fused and not approved for classification.
-02	O	With, for double alternator configuration	Req. 25E-04	
25H	OIL LEVEL SENSOR			
<i>The oil level sensor enables the engine operator to electronically read the level of oil in the engine as a part of the daily inspection. It is a complement to oil dipstick. The signal must be taken care of by the customer directly from the sensor.</i>				
-00	S	Without		
-02	O	With, but without electrical connection (connected and monitored by customer)		1 891 847
26A	FINE TUNE POTENTIOMETER			
-00	S	Without		
-01	O	With	Req. 26B-01	
26B	COORDINATOR			
-00	S	Without		
-01	O	With, incl. connector kit	Req. 26K-01, -02, -03 or -04	Note! This option is not approved for integration in a classified electrical monitoring system
-02	O	With, incl. connector and cable harness, 3 m	Req. 26K-01, -02, -03 or -04	1 793 627
26G	INSTRUMENT PANEL			
-00	S	Without		
-03	O	Instrument kit, containing gauges for oil pressure and coolant temp. monitoring		Note! This option is not approved for integration in a classified electrical monitoring system



Ref	Description	Requirements	Remark	Drw No
26H	SCANIA EMS DISPLAY			
<i>The EMS display is used to read out data, for example fuel consumption and configure specific parameters in the Engine Management System, for example alarm levels. The information is presented in an LCD display. It is also possible to read fault codes via the EMS display.</i>				
-00	S Without			
-01	O Instrument panel, 2-pole. Including cable harness to CBC, 3m	Req. 10M-00, -13 or -16; 26C-01		1 761 984
26K	COORDINATOR SETTINGS			
-00	S Without			
-01	O Fine tune potentiometer active, without alarm at 0 rpm			
-02	O Fine tune potentiometer active, with alarm at 0 rpm			
-03	O Fine tune potentiometer inactive, with alarm at 0 rpm			
-04	O Fine tune potentiometer inactive, without alarm at 0 rpm			
28B	ENGINE TEMP. REACTION (EMS parameter setting)			
<i>High engine temp reaction, 28B-03 to -06, is recommended in applications where the engine is remotely operated.</i>				
-01	S Only alarm (default value)		Note!	
-02	O Torque reduction on low limit		• For a classified engine: see applicable classification rules for the intended application.	
-03	O Engine stop on high limit		• Alarm is always included regardless of option.	
-04	O Engine stop on high limit and torque reduction on low limit		• Override possibility refer to engine stop only, not torque reduction	
-05	O Engine stop on high limit (with override possibility)			
-06	O Engine stop on high limit (with override possibility) and torque reduction on low limit			
28C	TEMP. LIMIT HIGH (EMS parameter setting)			
<i>This temp. limit decides the engine temp HIGH alarm limit that are described in 28B-.</i>				
-01	O 98°C			
-02	O 100°C			
-03	O 102°C			
-04	O 103°C			
-05	O 104°C			
-06	S 105°C (default value)			
28D	TEMP. LIMIT LOW (EMS parameter setting)			
<i>This temp. limit decides the engine temp LOW alarm limit that are described in 28B-.</i>				
-01	S 95°C (default value)			
-02	O 98°C			
-03	O 100°C	Not with 28C-01		
-04	O 103°C	Not with 28C-01, -02 or -03		



Ref	Description	Requirements	Remark	Drw No
28E	LOW OIL PRESSURE REACTION (EMS parameter setting)			
Low oil pressure reaction -03 or -04 is recommended in applications where the engine is remotely operated.				
-01	S Only alarm (default value)		Note! For a classified engine: see applicable classification rules for the intended application.	
-02	O Torque reduction, ~30%			
-03	O Engine stop			
-04	O Engine stop with override			
28F	LOW COOLANT LEVEL REACTION (EMS parameter setting)			
Low coolant level reaction -03 or -04 is recommended in applications where the engine is remotely operated. The option is only valid for engines with coolant level sensor, option 25C.				
-00	S Without	Req. 25C-00	Note! For a classified engine: see applicable classification rules for the intended application.	
-01	O Only alarm (default value if 25C-01)	Req. 25C-01		
-02	O Torque reduction, ~30%	Req. 25C-01		
-03	O Engine stop	Req. 25C-01		
-04	O Engine stop with override	Req. 25C-01		
28H	DROOP SETTING (EMS parameter setting)			
-01	O 0%		Droop setting for single speed engines. The value is defined as how much the engine speed increases from full load to zero load, in % in relation to nominal speed.	
-02	O 2.0%			
-03	O 3.5%			
-04	S 4.0% (default value)			
-05	O 6.0%			
-06	O 8.0%			
-07	O 10.0%			
28I	GOVERNOR SETTING (EMS parameter setting)			
-01	S Normal (default value)		Note! The optional settings 28I-02 and -03 should not be chosen without consulting after sales services, these options may only come into question after tests have been made at site.	
-02	O Soft			
-03	O Stiff			
28J	RAMP START DELAY (EMS parameter setting)			
-01	S 0 seconds (default value)		Note! At start this is the time the engine speed shall remain at low idle speed before starting the ramp up to nominal operational speed.	
-02	O 2 seconds			
-03	O 5 seconds			
-04	O 10 seconds			
-05	O 30 seconds			
-06	O 60 seconds			
-07	O 90 seconds			
-08	O 120 seconds			
28K	RAMP UP RATE (EMS parameter setting)			
-01	O 100 rpm/seconds		This is the rate by which the engine speed ramps up, starting from low idle up to nominal operational speed after the delay value defined in Ramp start delay (Price ref. 28J)	
-02	O 200 rpm/seconds			
-03	O 300 rpm/seconds			
-04	O 400 rpm/seconds			
-05	S 500 rpm/seconds (default value)			



Ref	Description	Requirements	Remark	Drw No
28N	LOW IDLE SPEED (EMS parameter setting)			
The low idle speed is set at such a level that resonance frequencies (critical speeds) in the powertrain are avoided.				
-01	O	500 rpm		
-02	O	550 rpm		
-03	O	600 rpm		
-04	O	650 rpm		
-05	O	700 rpm		
-06	O	750 rpm		
-07	O	800 rpm		
-08	O	850 rpm		
-09	O	900 rpm		
-10	O	950 rpm		
-11	S	1000 rpm (default value)		
-12	O	1050 rpm		
28O	THROTTLE SETTINGS (EMS parameter setting)			
Important to consider: Is there a risk for injuries of personnel or damages to equipment if the engine runs out of control?				
-06	S	Nominal speed 1500 / 1800 rpm (default value)		
-07	O	Fine tune of nominal speed always active	Note! Price ref. 28O-07 is intended for customers who wish to mount a potentiometer directly to the EMS for fine tuning of the nominal engine speed	
28S	HIGH CHARGE TEMP REACTION			
High charge temp reaction 28S-03 to -06 is recommended in applications where the engine is remotely operated.				
-01	S	Only alarm	Note!	
-02	O	Torque reduction on low limit	• For a classified engine: see applicable classification rules for the intended application.	
-03	O	Engine stop on high limit	• Alarm is always included regardless of option.	
-04	O	Engine stop on high limit and torque reduction on low limit	• Override possibility refer to engine stop only, not torque reduction	
-05	O	Engine stop on high limit (with override possibility)		
-06	O	Engine stop on high limit (with override possibility) and torque reduction on low limit		
28U	SPLIT FUELING			
-00	O	Without		
-01	S	With		
45	FLYWHEEL			
-01	S	SAE 14		1 925 825
46	FLYWHEEL HOUSING			
-01	S	SAE1 flange		1 925 826



Ref	Description	Requirements	Remark	Drw No
49	ENGINE BRACKET			
<i>Main factors to consider when selecting engine suspension are installation height of the engine and forces applied to the engine and driven equipment due to operating conditions. For further information please see the Installation manual.</i> <i>All engine suspensions are available with:</i> - Front-mounted brackets - Front- and rear-mounted brackets or - Front-mounted brackets and prepared for rear-mounted brackets, which means that the surface on the flywheel housing intended for rear-mounted brackets is unpainted.				
-01 S	Fixed low 120 mm below the crankshaft		Front-mounted brackets	1 927 370
-01Z O	Fixed low 120 mm below the crankshaft		Front-mounted brackets. Prepared for rear-mounted brackets.	1 927 370
-02 O	Fixed low 120 mm below the crankshaft		Front- and rear-mounted bracket	1 927 370
-03 O	Power pack type 230 mm below the crankshaft	Req. 78A-00	Front-mounted brackets	1 927 370
-03Z O	Power pack type 230 mm below the crankshaft	Req. 78A-00	Front-mounted brackets. Prepared for rear-mounted brackets.	1 927 370
-04 O	Power pack type 230 mm below the crankshaft	Req. 78A-00	Front- and rear-mounted brackets	1 927 370
-11 O	For repowering of P96 DI16 120 mm below the crankshaft	Req. 72-00	Front-mounted brackets	2 017 566
-11Z O	For repowering of P96 DI16 120 mm below the crankshaft	Req. 72-00	Front-mounted brackets. Prepared for rear-mounted brackets.	2 017 566
-12 O	For repowering of P96 DI16 120 mm below the crankshaft	Req. 72-00	Front- and rear-mounted bracket	2 017 566
49A	ENGINE SUSPENSION			
-00 S	Without			
-01 O	Stiff rubber suspension	Not with 49-02,-04 or -12	Front	1 918 804
-02 O	Stiff rubber suspension	Req. 49-02,-04 or -12	Front and rear	1 918 804
51	AIR CLEANER			
<i>The selection of air cleaner is dependent on the concentration of dust in the air that surrounds the engine.</i> <i>Light duty is suitable for applications working in low dust environment, ocean going. Medium duty is suitable for applications in dusty environments like river boats where dust from land easily can be carried to the vessel.</i>				
-00 S	Without			
-13 O	2 x medium duty Ø13" with safety cartridge		Separately. Without hose.	1 819 176
-14 O	2 x light duty Ø 8"		Mounted on turbo charger, pointing forward	1 529 410
56	EXHAUST BEND			
-01 S	Without, but with turbo-mounted flange	Req. 57-00		2 065 761
-03 O	2 x 90° bend (dry)	Req. 57-10, -11, -13 or -14		2 065 761
-04 O	2 x water cooled exhaust bends	Req. 57-00	Note! Only for engines with heat exchanger	2 065 761



Ref	Description	Requirements	Remark	Drw No
57	EXHAUST FITTINGS			
-00	S Without			
-10	O Flange, 2 x Ø114 mm			2 065 761
-11	O Flange, 2 x Ø130 mm			2 065 761
-13	O Compensator and flange, 2 x Ø114 mm			2 065 761
-14	O Compensator and flange, 2 x Ø130 mm			2 065 761

60	OIL SUMP			
-01	S Deep front oil sump			1 825 009
-03	O Low oil sump with ladder frame	Req. 25H-00		1 825 009

60A	OIL DIPSTICK			
-01	S Front of engine			2 103 570

60B ENGINE OIL, FACTORY FILLED

The engine can be delivered with factory filled engine oil. This option is suitable for customers that are interested in reducing or eliminating the handling of oil in their production process.

Engine oil: Scania LDF-3. Viscosity class: 10W-40. Outside temperature: -20°C - >+30°C.

-00	S Without			
-01	O For deep oil sump	Req. 60-01		
-02	O For low oil sump	Req. 60-03		

61	OIL FILLER			
-01	S In valve cover			2 103 570

62 OIL DRAINING

The selection of oil draining is dependent on the installation. Especially critical is the space available below and next to the oil drain plug. If space for a drain bucket is available, then the standard oil plug is preferred as a simple solution. The hand pump, or electrical pump, is used if the oil is drained to a level above the engine.

-01	S With plug			1 825 009
-03A	O With hand pump and 3-way cock on right hand side			1 825 226
-04A	O With hand pump and 3-way cock on left hand side			1 825 226
-05	O With electric pump and 3-way cock on right hand side		Delivered loose	1 407 848
-06	O With electric pump and 3-way cock on left hand side		Delivered loose	1 407 848

65 CRANKSHAFT

The crankshaft is a part subject to special requirements regarding traceability by the class societies. For approval by specific class societies this might be a requirement, to be checked with the class society.

-01	S Not classified			
-02	O With material certificate			
-03	O Classified by Lloyds Register			

Ref	Description	Requirements	Remark	Drw No
72	FAN			
<i>The selection of fan is dependent on the need for cooling of the engine. Factors that need to be considered are air pressure drop in the installation and necessary air flow. The fan is normally matched with the radiator chosen for the application.</i>				
-00	S Without			
-01	O Prepared for fan, ratio 1:0.9. With fan spacer 125 mm.		Note! Only for engines with keel cooling	1 927 865
-02	O Prepared for fan, ratio 1:1.1 With fan spacer 125 mm.		Note! Only for engines with keel cooling	1 927 865
-16	O Pusher, Ø965, ratio 1:0.9		Note! Only for engines with keel cooling	1 928 221
-17	O Pusher, Ø965, ratio 1:1.1 (1500 rpm)		Note! Only for engines with keel cooling Note! Only engine speed 1500 rpm is allowed	1 928 221
72A	FAN SPACER LENGTH			
-01	S 125 mm	Req. 72-01		1 940 791
-02	O 70 mm	Req. 72-01		1 940 791
-03	O 86 mm	Req. 72-01		1 940 791
-04	O 96 mm	Req. 72-01		1 940 791
-05	O 116 mm	Req. 72-01		1 940 791
-06	O 136 mm	Req. 72-01		1 940 791
-08	O 170 mm	Req. 72-01		1 940 791
78	SEA WATER PUMP			
<i>The self-priming centrifugal seawater pump is suitable for operations in water containing large amounts of sand, mud or solids. The self-priming pump can withstand to be run without water for a short period. Typical operations are river boats in muddy water and rescue boats that may have to enter the shore during operation.</i>				
-00	S Without		Note! Only for engines with keel cooling	
-01	S With pump, but without connection		Note! Only for engines with heat exchanger	
-02	O With connection hoses		Note! Only for engines with heat exchanger	2 254 367
-03	O With connection tubes		Note! Only for engines with heat exchanger	2 254 367
-11	O Self-priming centrifugal pump		Note! Only for engines with heat exchanger	1 934 597
-12	O Self-priming centrifugal pump with tube connection to pump and hose connection to heat exchanger		Note! Only for engines with heat exchanger	
-13	O Self-priming centrifugal pump with tube connection		Note! Only for engines with heat exchanger	
78A	BILGE PUMP			
-00	S Without			
-01	O With 2" connection	Req. 90-00 and 72-00		2 108 801



Ref	Description	Requirements	Remark	Drw No
90	FRONT-MOUNTED POWER TAKE-OFF (PTO)			
A front-mounted PTO is suitable for applications that need high torques, for example large auxiliary pumps and air compressors. Normally the driven equipment is mounted separate from the engine.				
-00	S Without			
-01	O Stub shaft for connection of flexible coupling	Req. 72-00	Note! Max torque 800Nm	1 883 995
-02	O Crankshaft pulley with two extra grooves, Ø260 mm	Req. 72-00		1 883 995
-04	O Crankshaft pulley with three extra grooves, Ø260 mm	Req. 72-00		1 883 995
-05	O Stub shaft for connection of flexible coupling with crankshaft pulley with three extra grooves, Ø260 mm.	Req. 72-00		1 883 995
91	SIDE-MOUNTED POWER TAKE-OFF (PTO)			
A side-mounted PTO is used for low rated engine-mounted hydraulic pumps or compressors.				
-00	S Without			
-01	O Prepared for SAE B, rear-mounted			
-02	O SAE B, 2-hole with shaft SAE B. Gear ratio 1:1.19, clockwise rotation. Rear-mounted.			1 507 581
93	HYDRAULIC PUMP			
-00	S Without			
-01	O Capacity 16 l/min at 170 bar intermittent, 25-30 bar continuous		Note! Without pressure reduction valve	1 457 713
-02	O Capacity 25 l/min at 170 bar intermittent, 25-30 bar continuous		Note! Without pressure reduction valve	1 457 713
96C	STUDS IN FLYWHEEL HOUSING			
-00	S Without			
-01	O With			
98C	FUEL PRE-FILTER			
Fuel pre-filter is required for all Scania marine engines. Water will condensate in the tank and enter the fuel, thus a risk of engine disturbances. The fuel pre-filter separates water from the fuel. The option without is valid for customers who uses a non-Scania pre-filter.				
-00	O Without		Note! 98C-00 requires a water separating pre-filter from an external manufacturer. If no filter is mounted the engine warranty is not valid.	
-01	S Single fuel filter with water separator	Req. 10M-00	Note! Not type approved by any classification society.	1 774 501
-03	O Reversible dual fuel filter with water separator		Note! Type approved by ABS and BV.	1 769 500
98D	CAB HEATER			
-00	S Without			
-01	O Prepared for cab heater connection		Pipe outer Ø22 mm, hose inner Ø20 mm	
99G	PAINTWORK			
-01	S Orange heavy duty quality / silver on warm parts			



Ref	Description	Requirements	Remark	Drw No
99L	CRANKCASE VENTILATION			
-01	S Closed ventilation			2 017 567
99P	OPERATOR'S MANUAL			
-00	O Without		Note! If a preferred language is not specified when ordering, the operator's manual will be delivered in English. Available languages are: Chinese (simplified), Chinese (trad.), Czech, Danish, Dutch, English, Finnish, French, German, Italian, Japanese, Korean, Norwegian, Polish, Portuguese, Russian, Spanish and Swedish	
-01	S 1 copy			
-02	O 2 copies			
-03	O 3 copies			
99Q	SPARE PARTS CATALOGUE			
-00	S Without			
-01	O 1 copy			
-02	O 2 copies			
-03	O 3 copies			
99T	FUEL MAIN FILTER			
<i>Reversible fuel filters enable the switching of fuel filters during operation. This is required by classification societies in many applications.</i>				
-00	S Single fuel filter			
-01	O Reversible dual fuel filter		Note! Approved for classification.	
99U	FUEL HOSES			
-00	O Without			
-01	S With nipples		For hose, inner Ø9 mm	
-02	O With two fuel hoses		For connection to pipe, outer Ø12 mm	



7 | EQUIPMENT DATA

ref 25-58

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25E ALTERNATOR.....	3
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Information about this section

This section is intended as a complement to the Engine data sections with additional information about engine equipment such as technical data, measurements and illustrations. Note that if a certain equipment does not have any additional information, other than that in the Engine data sections, it is not found in this section.

In association with each ordering reference the engine series, for which the equipment is intended, is stated.

Note! All conditions and requirements when ordering and combining equipment are stated in the Engine data sections 4-6 and are to be used when specifying your order.

S = Standard equipment

O = Optional equipment

Dimensions on sketches

The sketches are intended for sales information only and must not be used for installation purposes as drawings could have been updated without notice. Before dimensioning any installation, please refer to the latest issue of a valid Scania drawing. All drawings can be ordered from Scania (via Pre-sales FRAS) with short notice and will be delivered free of charge.

Installation manual

If you need more information related to your installation than you find in the Data Handbook, we refer to the installation manual (<http://til.scania.com>). Below you can what sections and information you find in the installation manual:

1 Industrial and Generator engines

- 1:01 Engine
- 1:02 Intake system and ventilation
- 1:03 Fuel system
- 1:04 Exhaust system
- 1:05 Cooling system
- 1:06 Technical data
- 1:07 SCR-system
- 1:08 Measuring instructions for installation inspection

2 Marine engines

- 2:01 Engine
- 2:02 Intake system and ventilation
- 2:03 Fuel system
- 2:04 Exhaust system
- 2:05 Cooling system
- 2:06 Technical data
- 2:08 Measuring instructions for installation inspection

3 Electrical equipment

- 3:01 General electrical
- 3:02 Electrical systems
- 3:03 Instrumentation 2.0
- 3:05 CAN interface
- 3:10 Fault codes DM 1 XPI S8



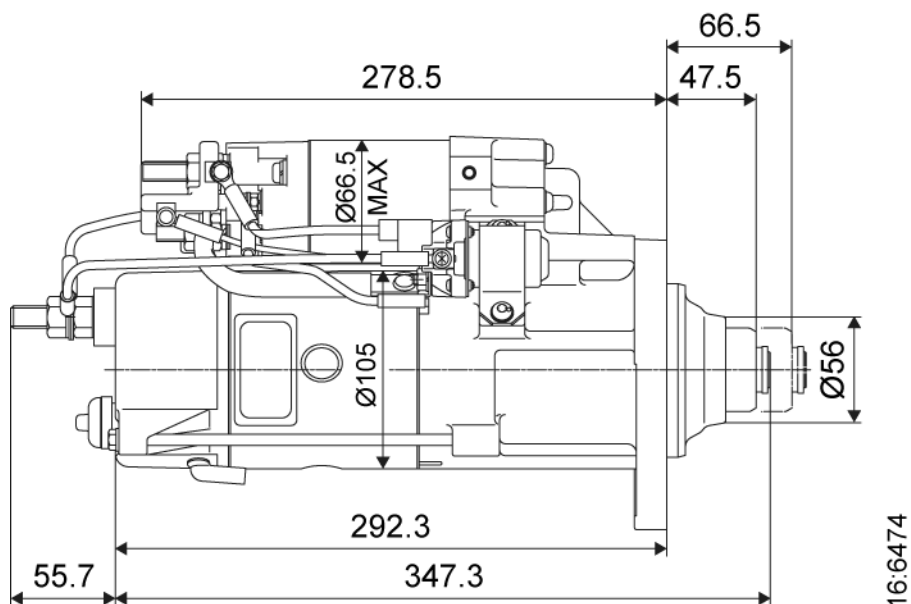
25D STARTER

9-series, 13-series, 16-series

-01 S 2-pole, 7.0 kW, EMS controlled

Drawing: 1 882 043

DI9, DI13, DI16



FOR SALES
INFORMATION ONLY

25E ALTERNATOR

9-series, 13-series, 16-series

-01 S 2-pole, 100 A, EMS controlled

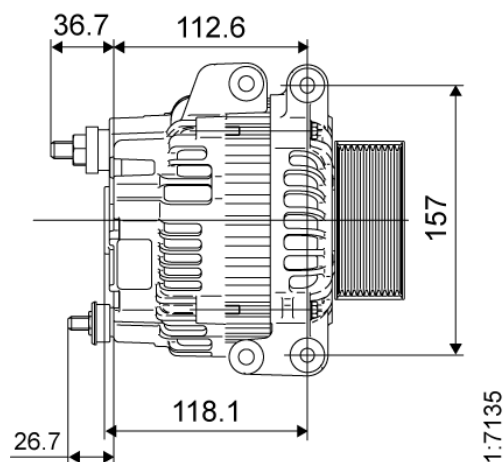
Drawing: 1 743 548

DI9, DI13, DI16

-04 O 2-pole, 2 x 100 A, EMS controlled

Drawing: 1 743 548

DI9, DI13, DI16



FOR SALES
INFORMATION ONLY

7A



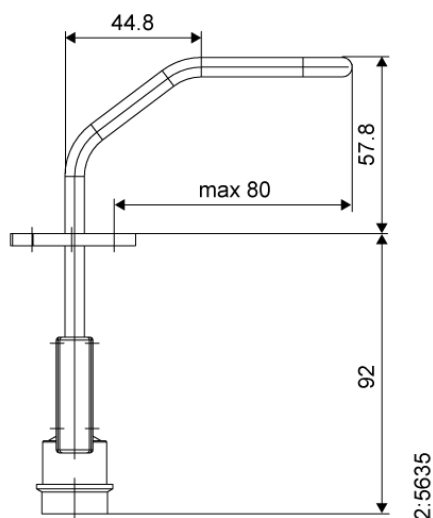
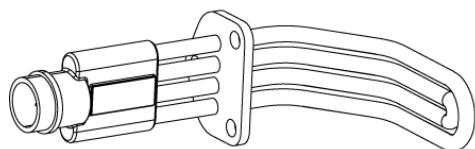
25F ENGINE HEATER

9-series, 13-series

-01 ○ 1500 W/230 V, plug in type

Drawing: 1 722 729

DI9, DI13



FOR SALES
INFORMATION ONLY

-06 ○ 1500 W/115 V,
plug in with thermostat

Drawing: 2 074 315

DI9, DI13

-07 ○ 1500 W/230 V,
plug in with thermostat

Drawing: 2 074 021

DI16

-08 ○ 550 W/230 V,
plug in with thermostat

Drawing: 2 074 315

DI9, DI13

Drawing: 2 074 021

DI16

-09 ○ 550 W/115 V,
plug in with thermostat

Drawing: 2 074 315

DI9, DI13

Drawing: 2 074 021

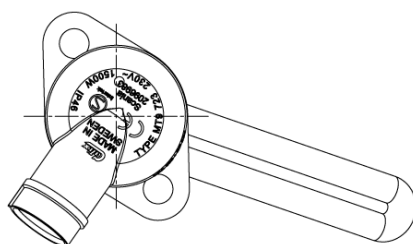
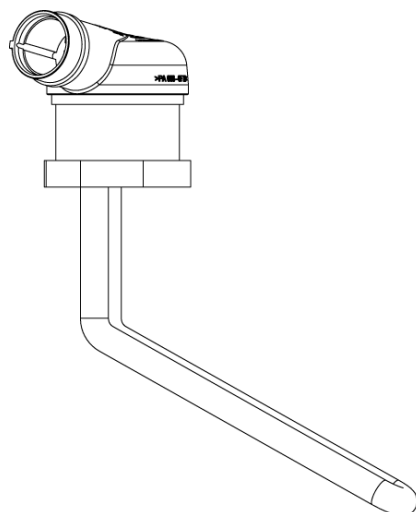
DI16

Drawing: 2 074 315

DI9, DI13

Drawing: 2 074 021

DI16



FOR SALES
INFORMATION ONLY

2:5661



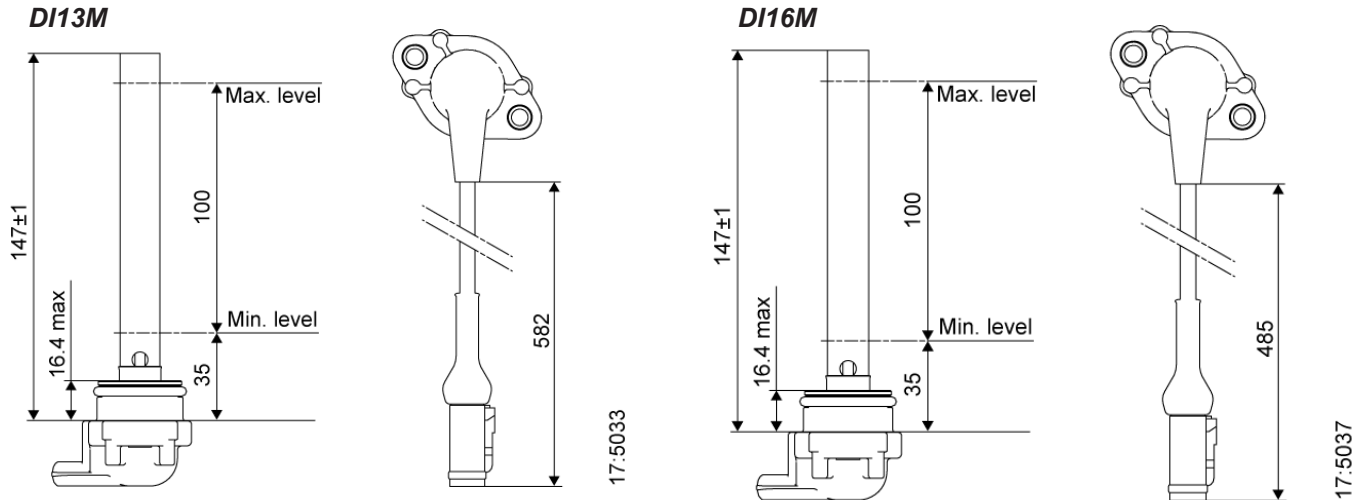
25H OIL LEVEL SENSOR

9-series, 13-series, 16-series

- 02 O With, but without electrical connection (connected and monitored by customer)

Drawing: 1 891 846
Drawing: 1 891 847

DI9, DI13
DI16



FOR SALES INFORMATION ONLY

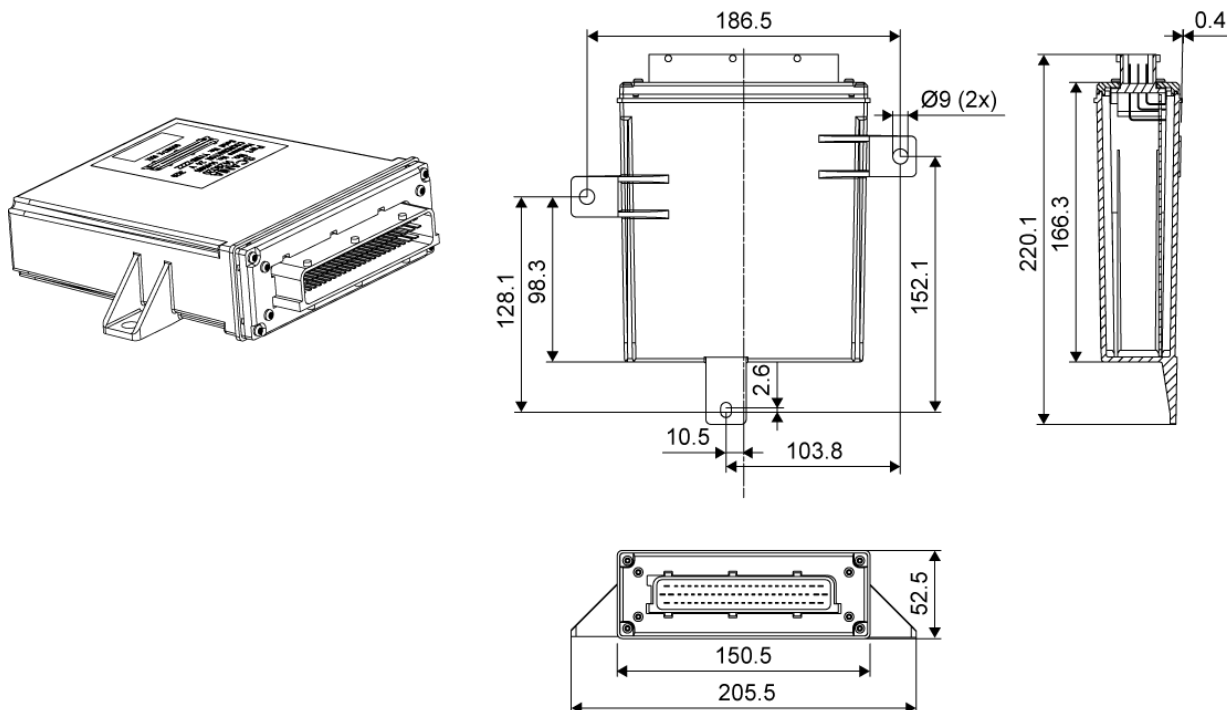
26B COORDINATOR

9-series, 13-series, 16-series

- 01 O With, incl. connector kit
- 02 O With, incl. connector and cable harness, 3 m

Drawing: 1 793 627
Drawing: 1 793 627

Auxiliary engines only
Auxiliary engines only



FOR SALES INFORMATION ONLY

7A



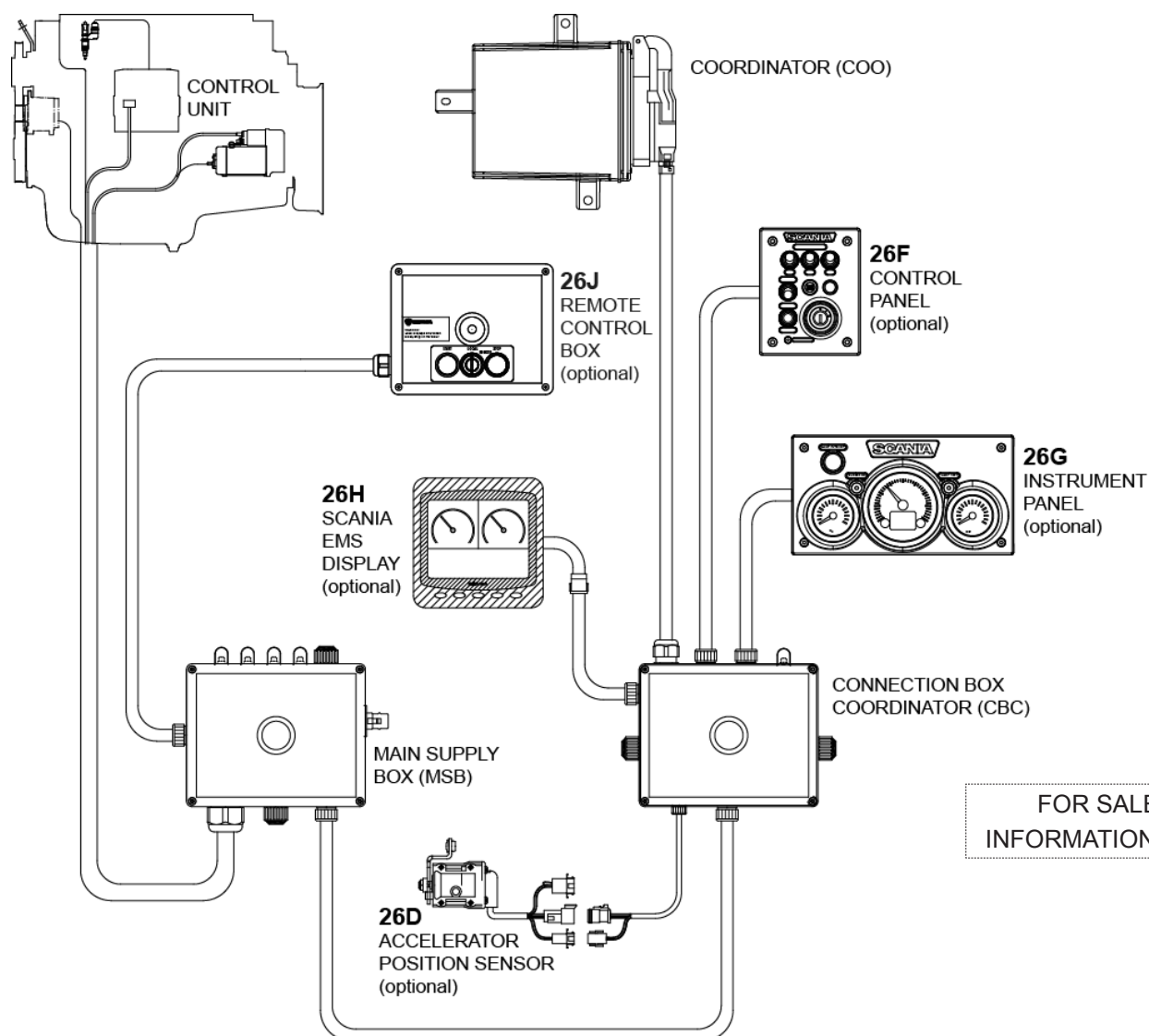
26C BASE SYSTEM

9-series, 13-series, 16-series

-01 O With

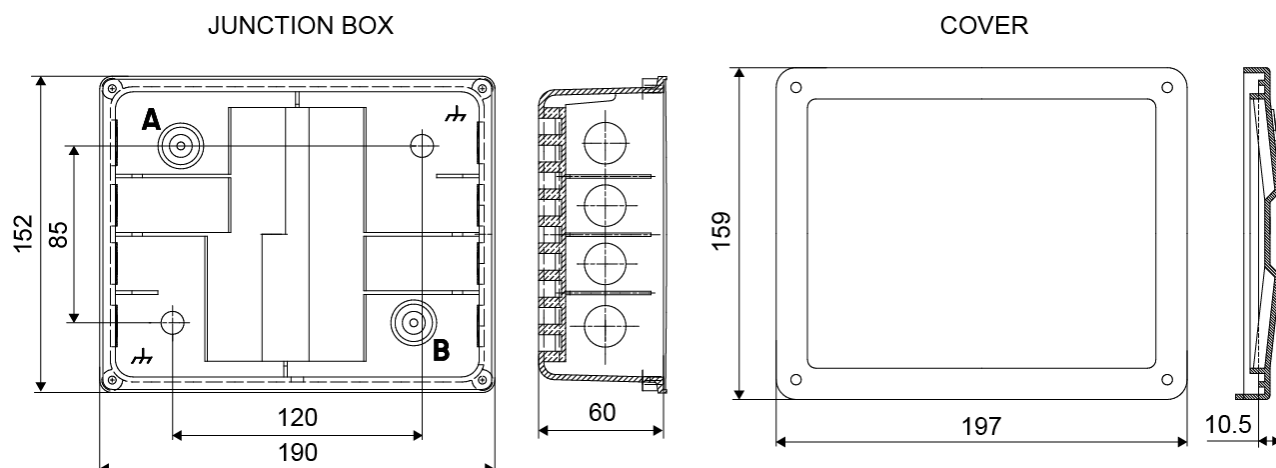
Drawing: 2 181 152

All-speed engines only



16:6476

Main Supply Box / Connection Box Coordinator / Remote Control Box:



16:6486



26D ACCELERATOR POSITION SENSOR

9-series, 13-series, 16-series

-01 O Sensor with cable 2 m

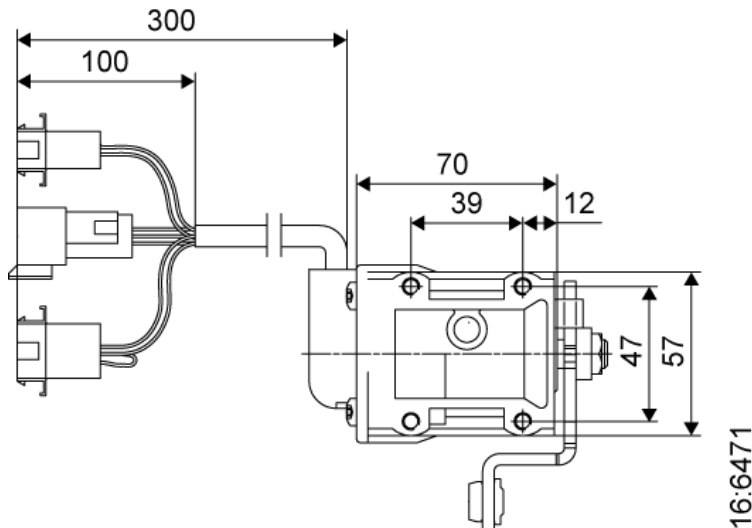
Drawing: 1 364 185

All-speed engines only

-02 O Sensor with cable 8 m

Drawing: 1 364 185

All-speed engines only



FOR SALES
INFORMATION ONLY

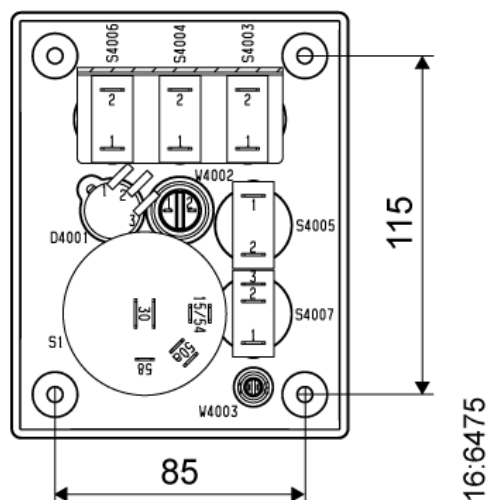
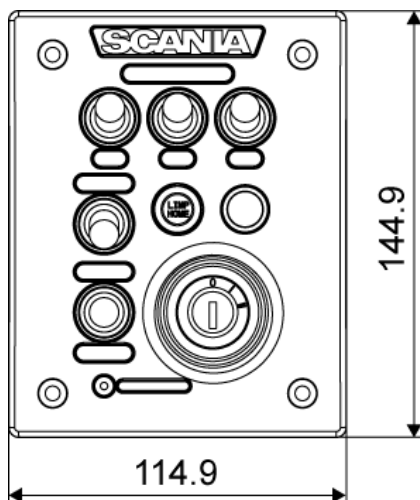
26F CONTROL PANEL

9-series, 13-series, 16-series

-01 O With, one panel

Drawing: 2 014 191

All-speed engines only



FOR SALES
INFORMATION ONLY

7A

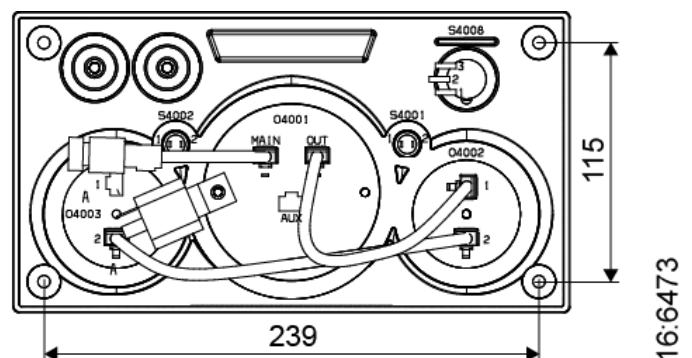
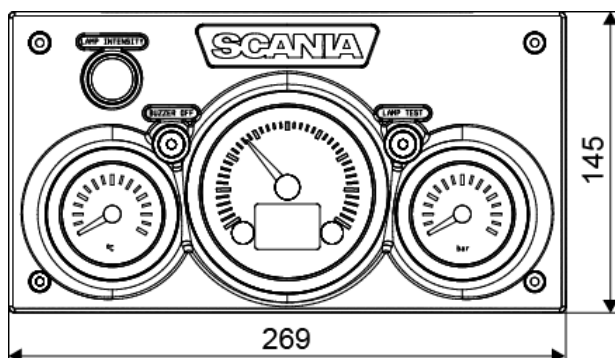
26G INSTRUMENT PANEL

9-series, 13-series, 16-series

-01 O With, 2-pole

Drawing: 2 013 194

All-speed engines only



FOR SALES INFORMATION ONLY

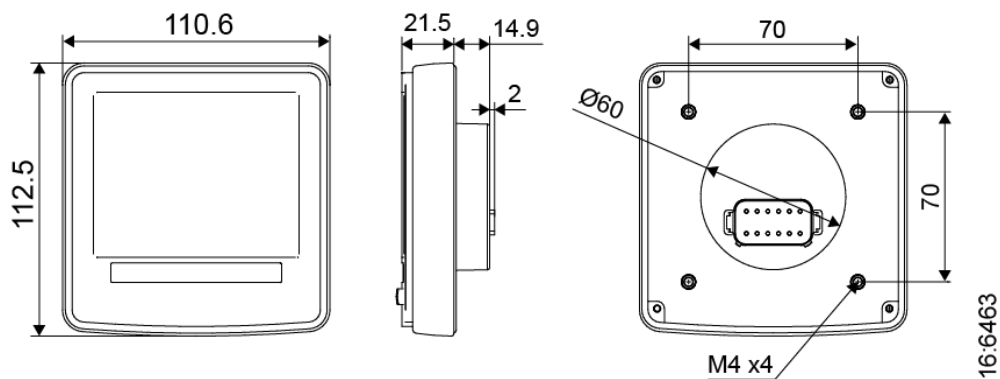


26H SCANIA EMS DISPLAY

9-series, 13-series, 16-series

-01 O Instrument panel, 2-pole. Including Drawing: 1 761 984
cable harness to CBC, 3 m.

All-speed engines only



FOR SALES INFORMATION ONLY

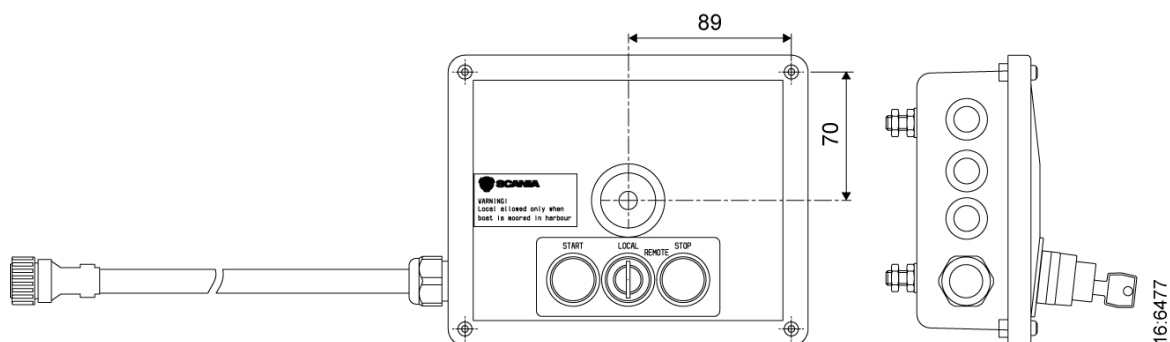
26J REMOTE CONTROL BOX

9-series, 13-series, 16-series

-01 O With cable, length 4 m

Drawing: 1 902 912

All-speed engines only



FOR SALES INFORMATION ONLY



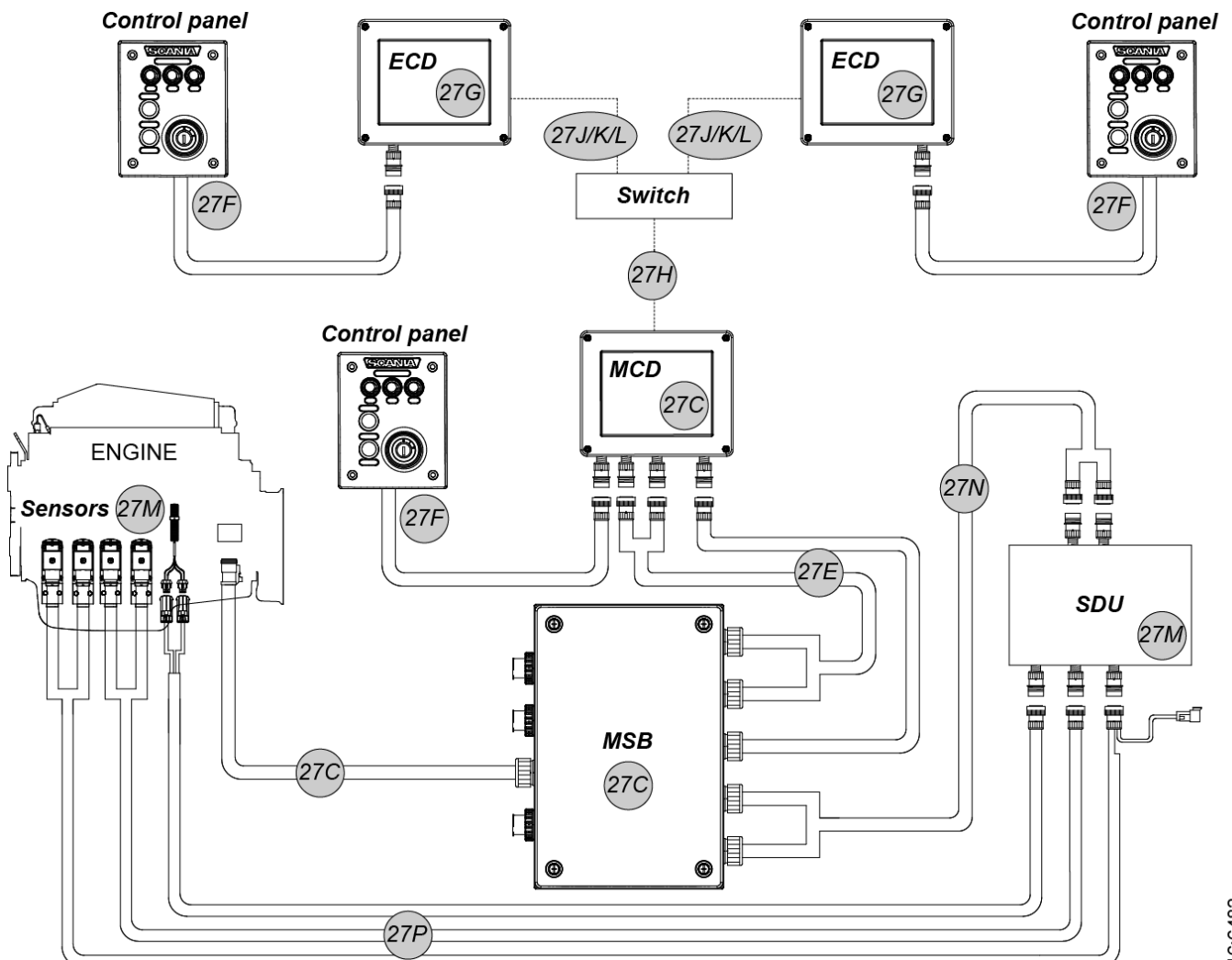
27 SCANIA INSTRUMENTATION 2.0 - System overview

9-series, 13-series, 16-series

Drawing: 2 135 526

All-speed engines only

- 27C Base system 2.0
- 27E Cable length between MSB and MCD
- 27F Control panel
- 27G Extra Control Display, ECD
- 27H Cable length between MCD and ECD-switch
- 27J Cable length to Extra Control Display (ECD) 1
- 27K Cable length to Extra Control Display (ECD) 2
- 27L Cable length to Extra Control Display (ECD) 3
- 27M Type approved instrumentation
- 27N Cable length between MSB and SDU
- 27P Cable length between engine and SDU



7 A

16:6482

FOR SALES INFORMATION ONLY



27C BASE SYSTEM 2.0

9-series, 13-series, 16-series

-01 O With 3 m cable

Drawing: 2 135 526

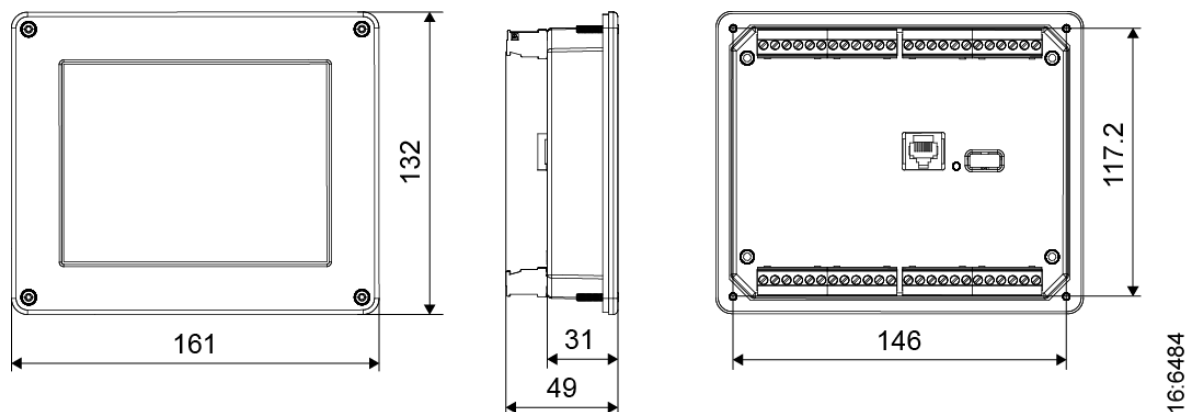
All-speed engines only

-02 O With 6 m cable

Drawing: 2 135 526

All-speed engines only

Master Control Display, MCD



FOR SALES INFORMATION ONLY

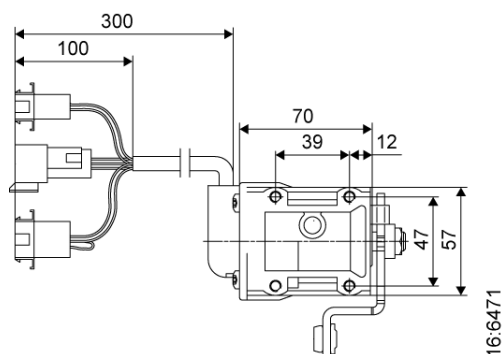
27D ACCELERATOR POSITION SENSOR

9-series, 13-series, 16-series

-01 O With

Drawing: 1 364 185

All-speed engines only



FOR SALES INFORMATION ONLY



27F CONTROL PANEL

9-series, 13-series, 16-series

-01 O 1 set

Drawing: 2 135 526

All-speed engines only

-02 O 2 sets

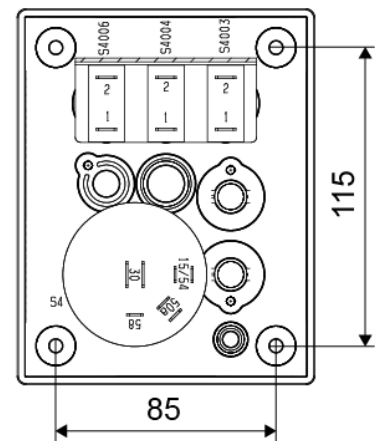
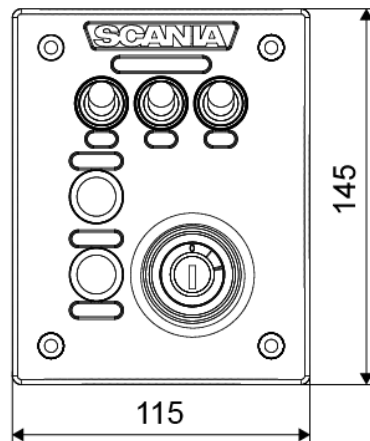
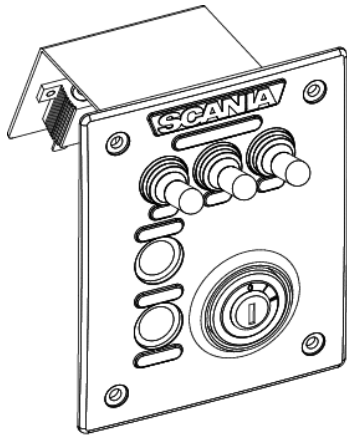
Drawing: 2 135 526

All-speed engines only

-03 O 3 sets

Drawing: 2 135 526

All-speed engines only



16:6483

FOR SALES INFORMATION ONLY

27G EXTRA CONTROL DISPLAY (ECD)

9-series, 13-series, 16-series

-01 O 1 display

Drawing: 2 135 526

All-speed engines only

-02 O 2 displays

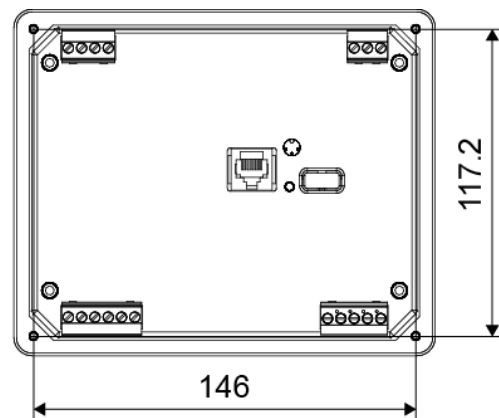
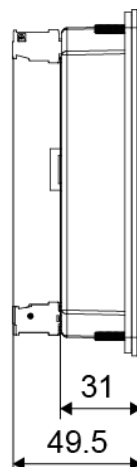
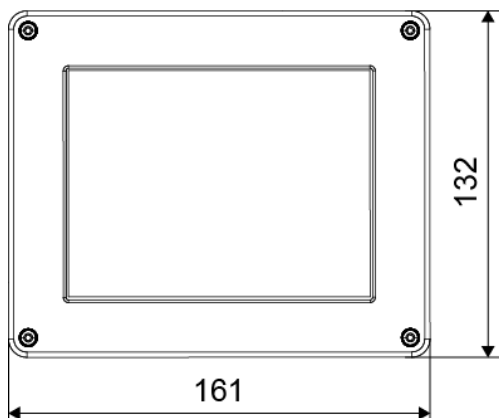
Drawing: 2 135 526

All-speed engines only

-03 O 3 displays

Drawing: 2 135 526

All-speed engines only



16:6485

FOR SALES INFORMATION ONLY

7A



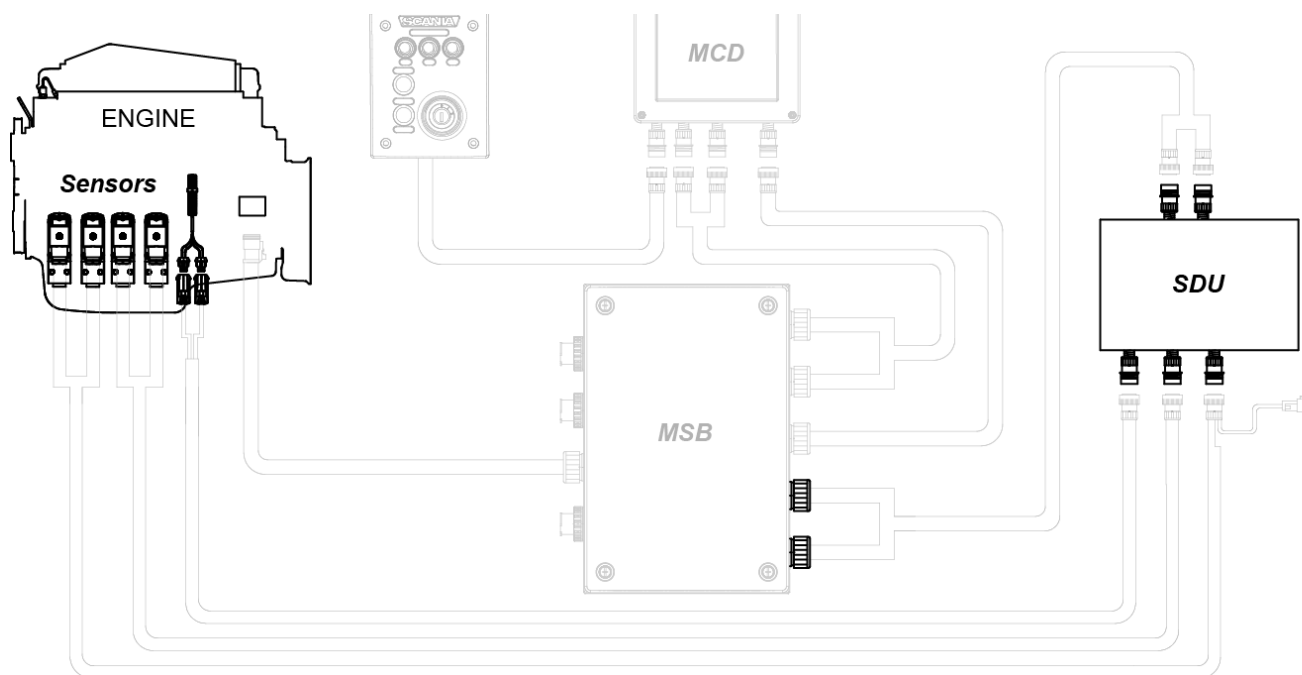
27M TYPE APPROVED INSTRUMENTATION

9-series, 13-series, 16-series

-01 O With

Drawing: 2 135 526

All-speed engines only



FOR SALES INFORMATION ONLY



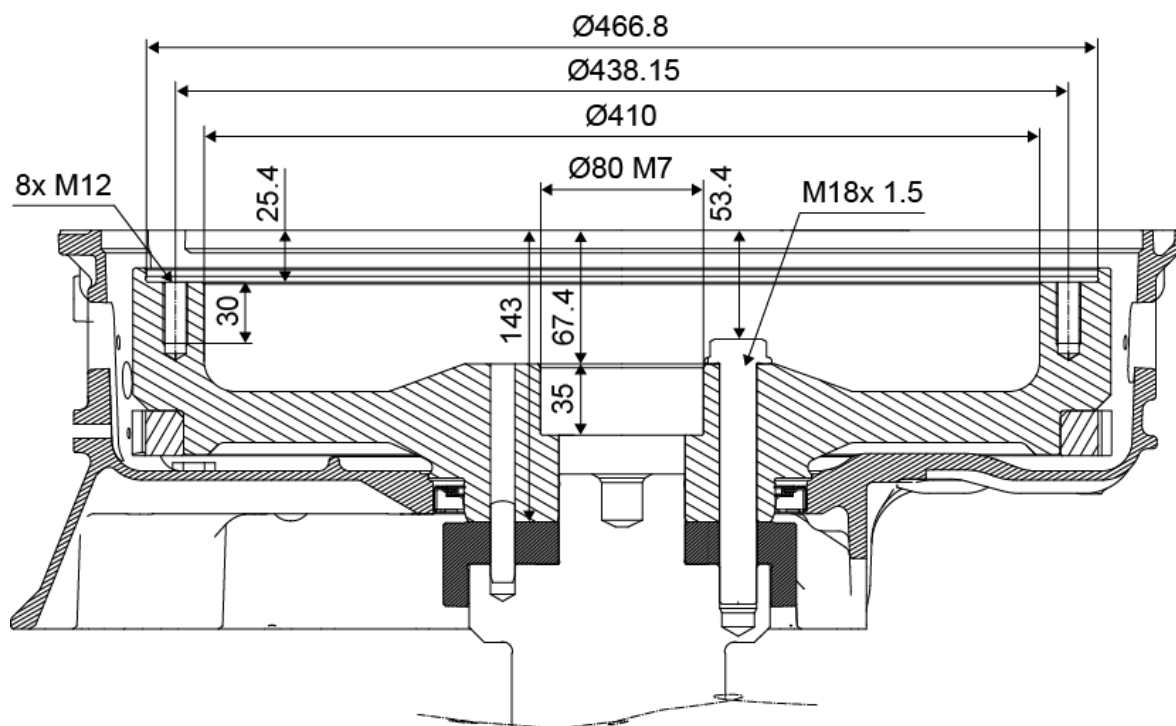
45 FLYWHEEL

9-series, 13-series, 16-series

-01 S SAE 14

Drawing: 1 925 825

D19, D113, D116



FOR SALES INFORMATION ONLY

1:7011



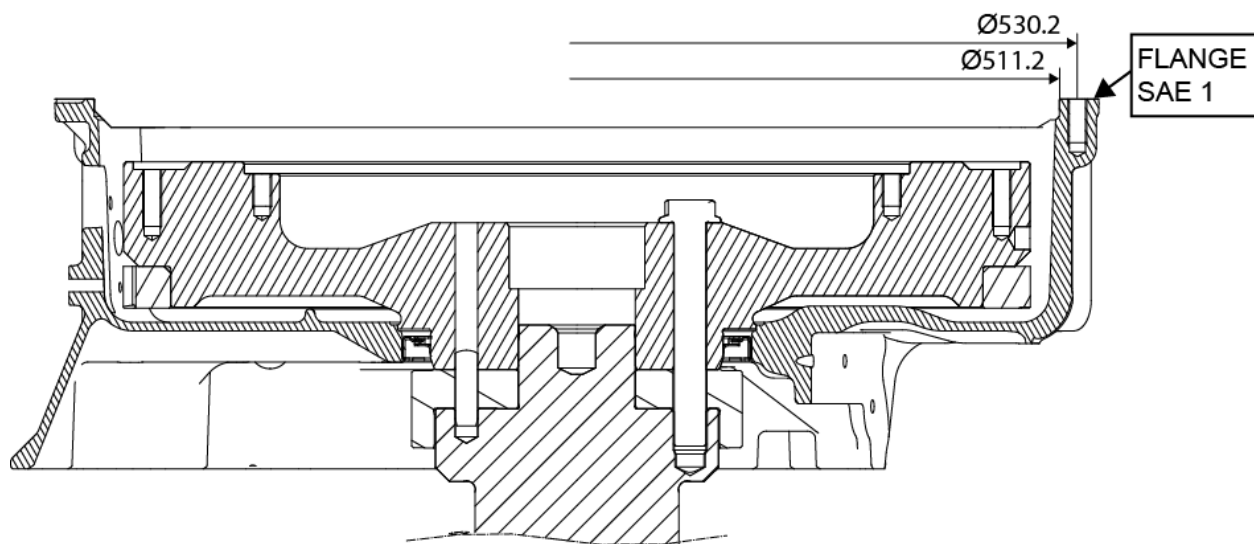
46 FLYWHEEL HOUSING

9-series, 13-series, 16-series

-01 S SAE1 flange

Drawing: 1 925 826

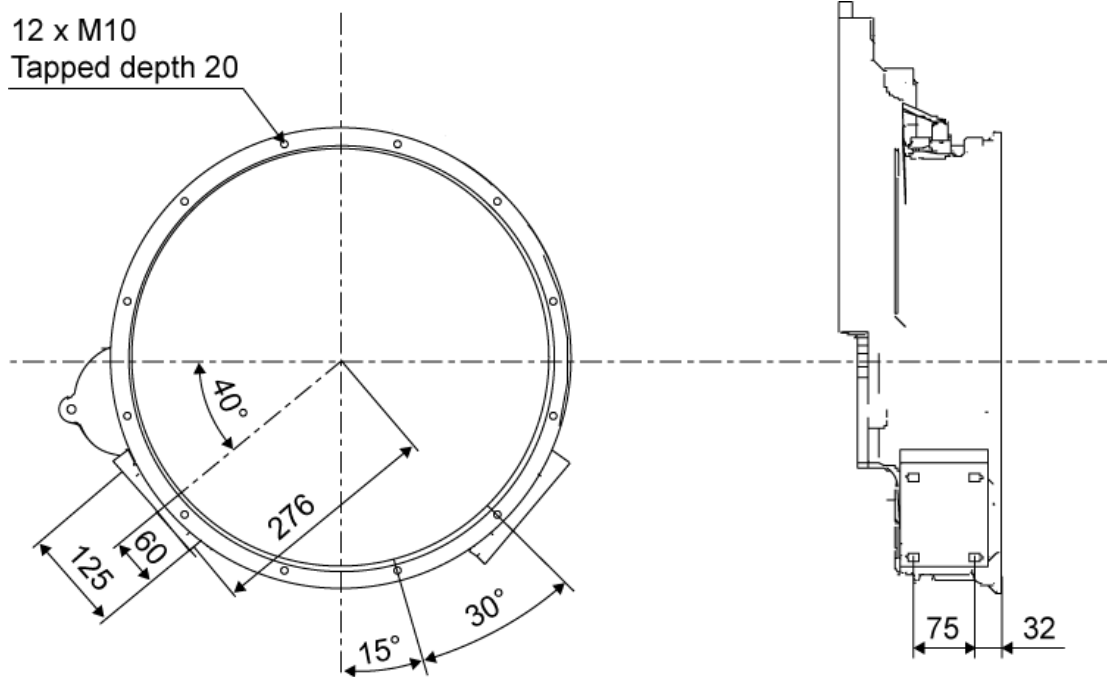
DI9, DI13, DI16



1:7191

FOR SALES INFORMATION ONLY

12 x M10
Tapped depth 20



1:7015

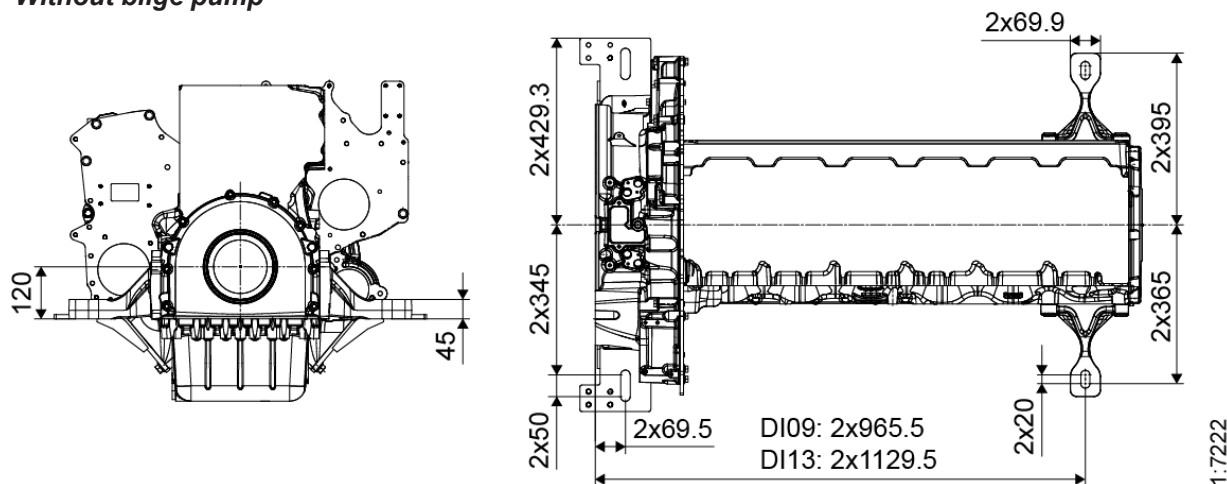


49 ENGINE BRACKET

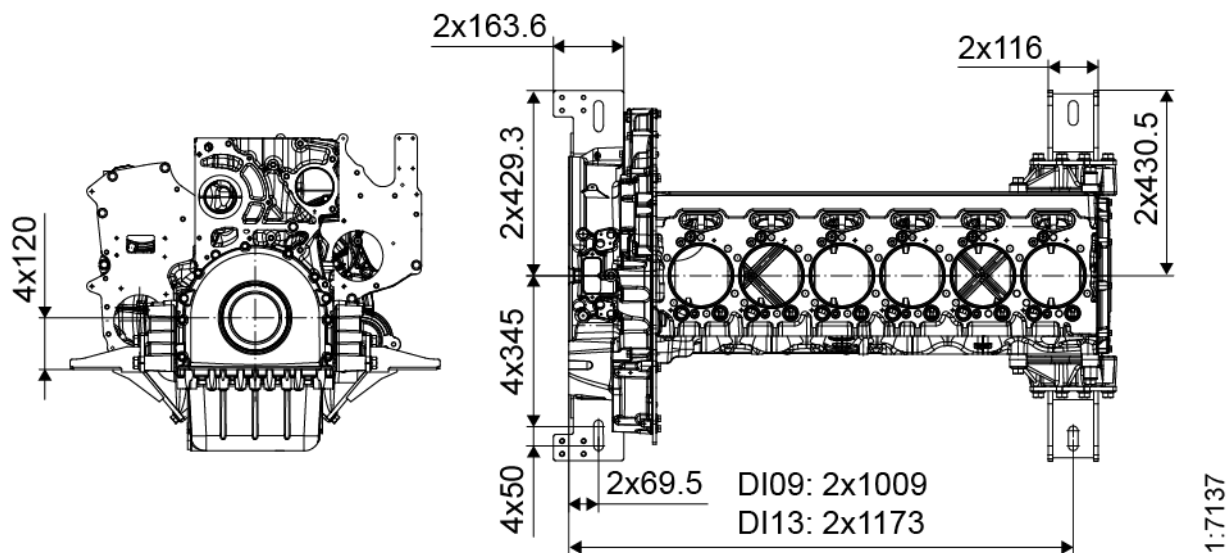
9-series, 13-series

- | | | |
|--|--------------------|-----------|
| -01 S Fixed low, 120 mm below the crankshaft. Front-mounted brackets | Drawing: 1 866 025 | DI9, DI13 |
| -02AO Fixed low, 120 mm below the crankshaft. Front- and rear-mounted brackets | Drawing: 1 866 025 | DI9, DI13 |

*For engines delivered from 7 September (DI9 and DI13):
Without bilge pump*



*For engines delivered to 6 September (DI13): With and without bilge pump
For engines delivered from 7 September (DI9 and DI13): With bilge pump*



FOR SALES INFORMATION ONLY



49 ENGINE BRACKET

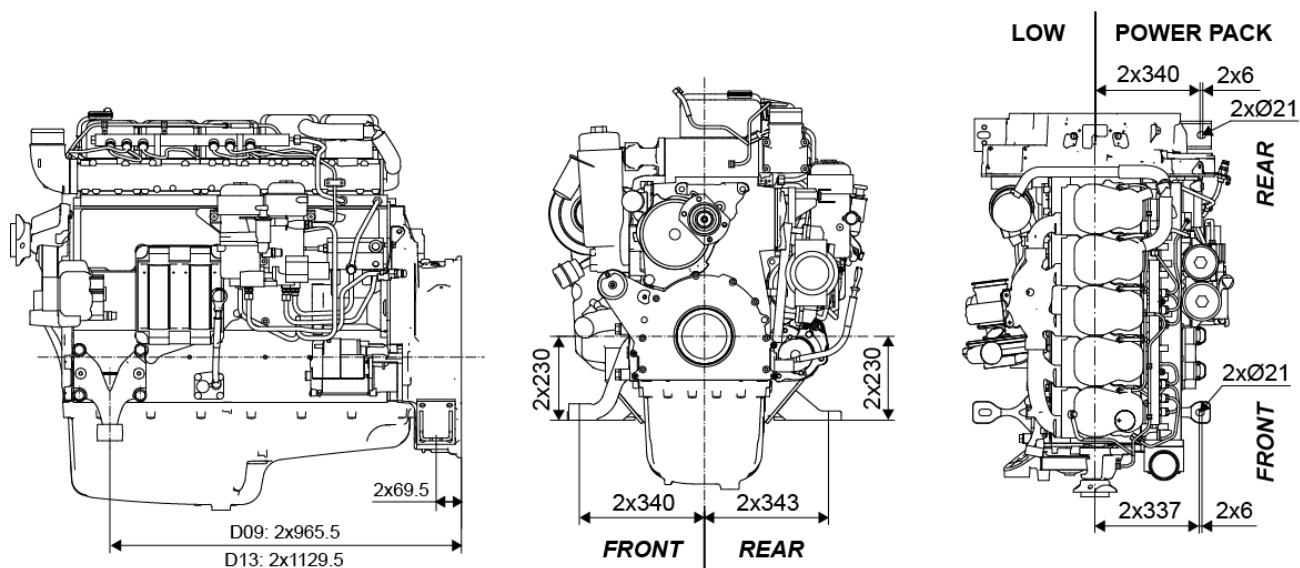
9-series, 13-series

-03 O Power pack type, 230 mm below the crankshaft. Front-mounted brackets
Drawing: 1 858 891

DI9, DI13

-04 O Power pack type, 230 mm below the crankshaft. Front- and rear-mounted brackets
Drawing: 1 858 891

DI9, DI13



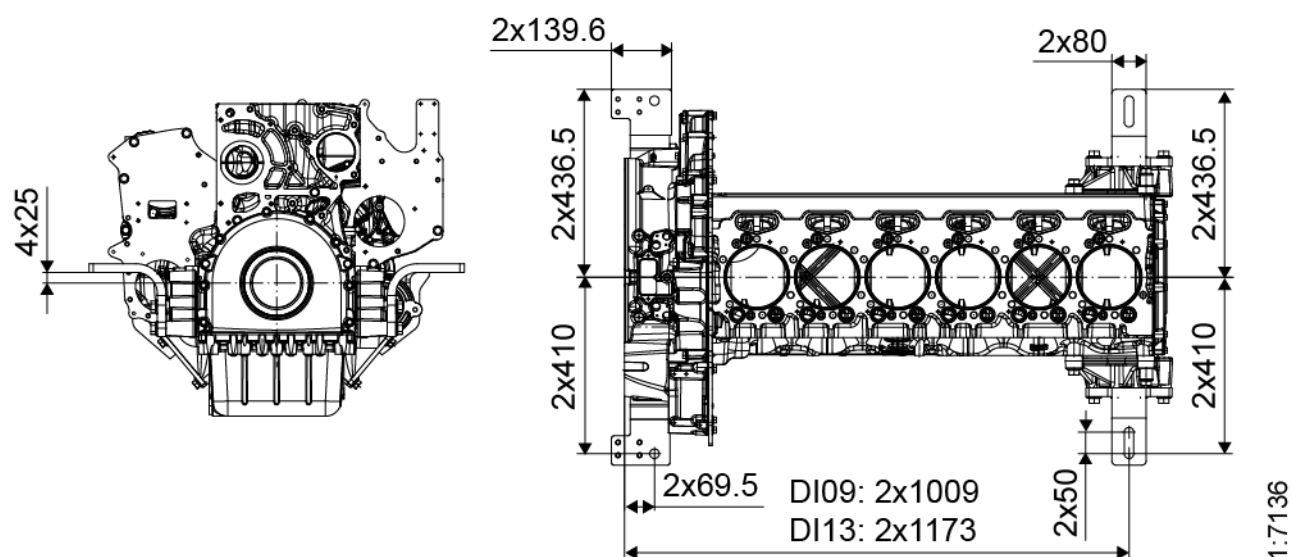
FOR SALES INFORMATION ONLY

-09 O Fixed extra low, 25 mm above the crankshaft. Front-mounted brackets
Drawing: 1 866 025

DI9, DI13

-10 O Fixed extra low, 25 mm above the crankshaft. Front- and rear-mounted brackets
Drawing: 1 866 025

DI9, DI13



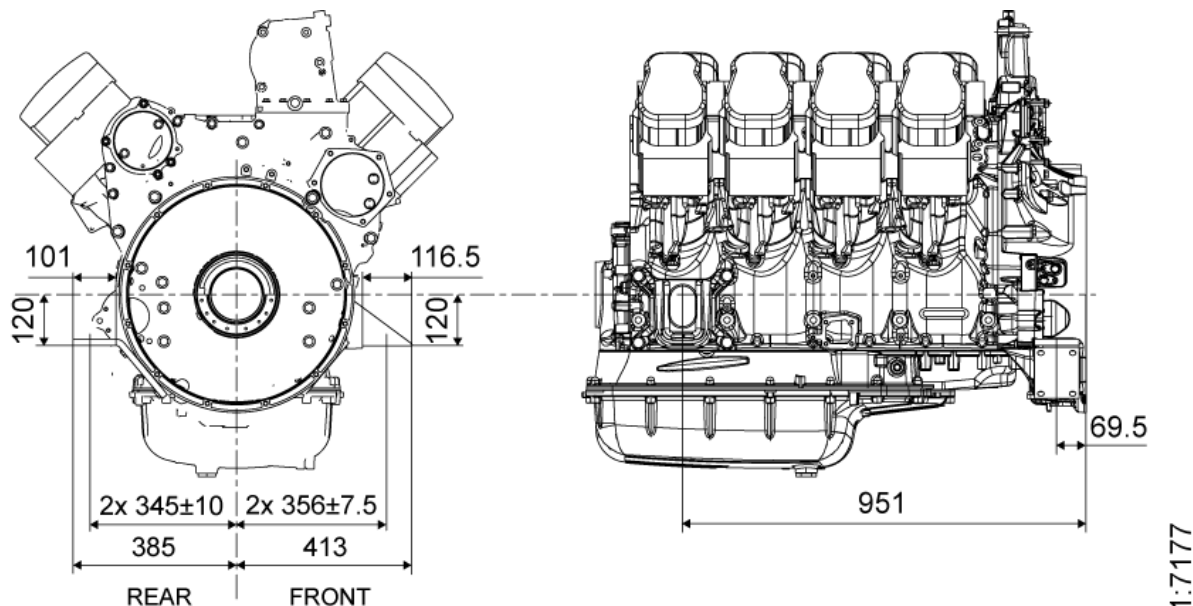
FOR SALES INFORMATION ONLY



49 ENGINE BRACKET

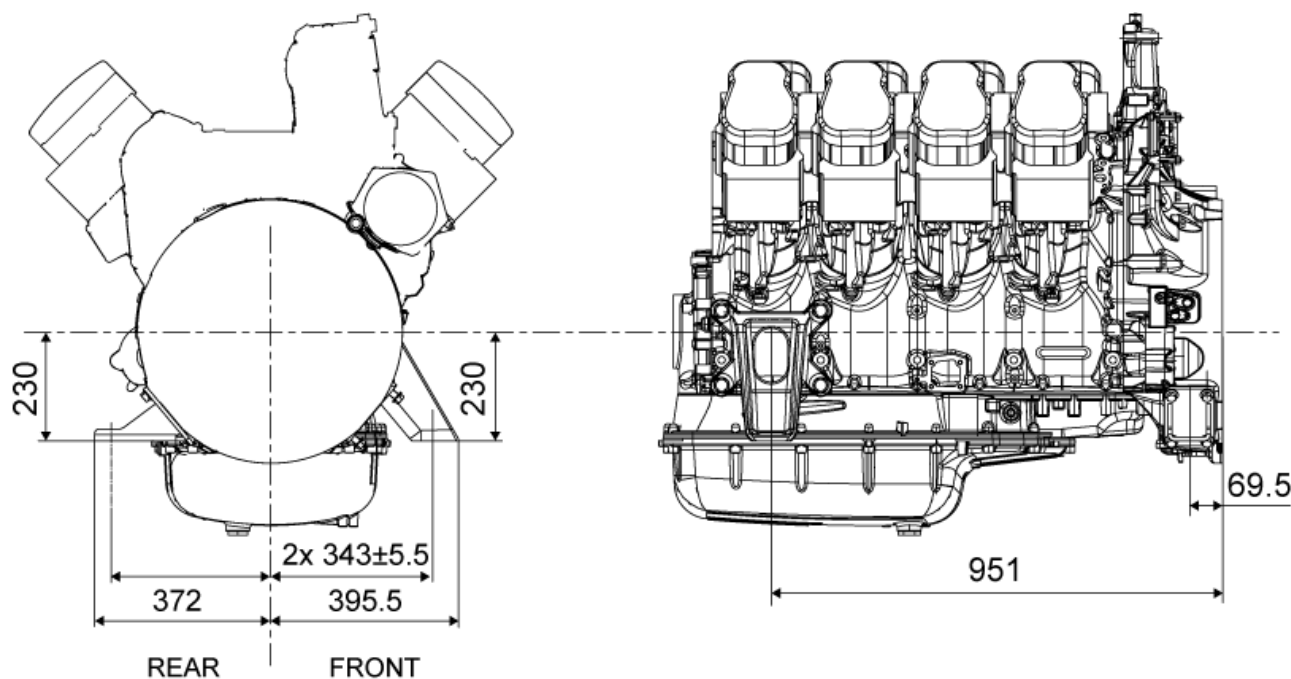
16-series

- | | | |
|--|--------------------|------|
| -01 S Fixed low, 120 mm below the crankshaft. Front-mounted brackets | Drawing: 1 927 370 | D116 |
| -02 O Fixed low, 120 mm below the crankshaft. Front- and rear-mounted brackets | Drawing: 1 927 370 | D116 |



FOR SALES INFORMATION ONLY

- | | | |
|--|--------------------|------|
| -03 O Power pack type, 230 mm below the crankshaft. Front-mounted brackets | Drawing: 1 927 370 | D116 |
| -04 O Power pack type, 230 mm below the crankshaft. Front- and rear-mounted brackets | Drawing: 1 927 370 | D116 |



FOR SALES INFORMATION ONLY



49 ENGINE BRACKET

16-series

-09 ○ Fixed extra low, 25 mm above the crankshaft. Front-mounted brackets

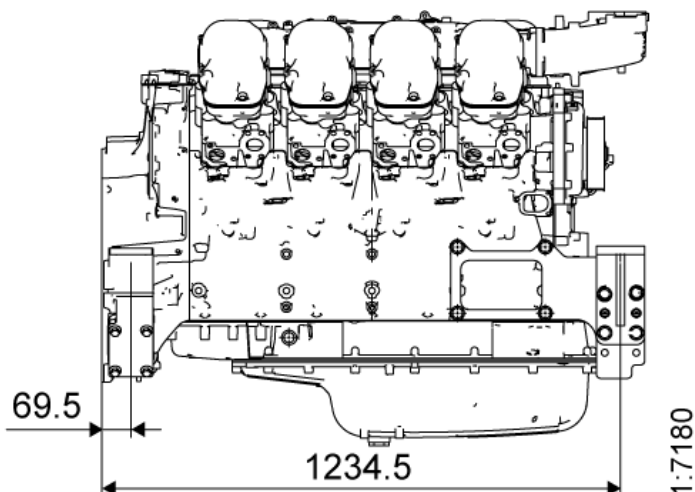
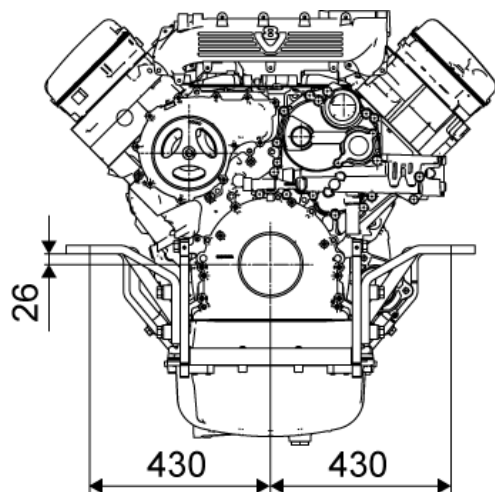
Drawing: 2 017 566

All-speed engines only

-10 ○ Fixed extra low, 25 mm above the crankshaft. Front- and rear-mounted brackets

Drawing: 2 017 566

All-speed engines only



FOR SALES INFORMATION ONLY

-11 ○ For repowering of P96 DI16, 120 mm below the crankshaft. Front-mounted brackets.

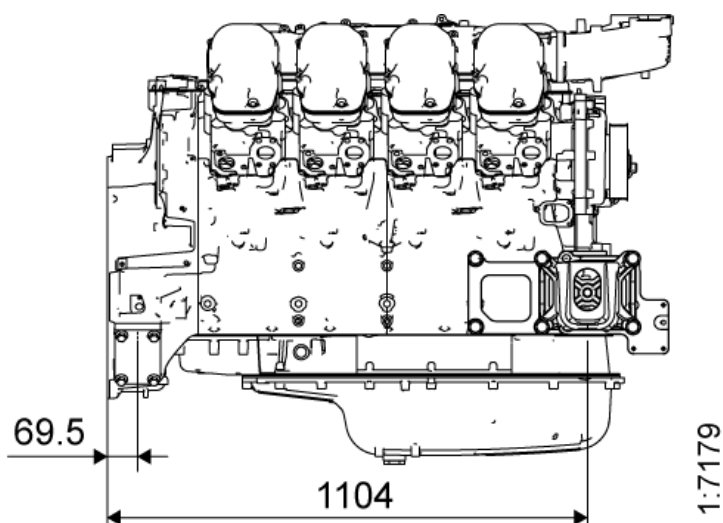
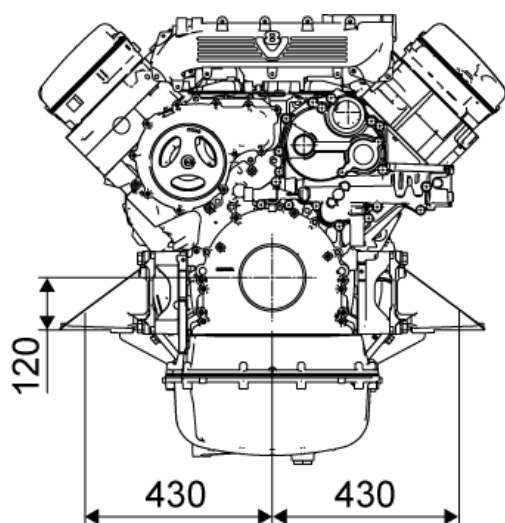
Drawing: 2 017 566

DI16

-12 ○ For repowering of P96 DI16, 120 mm below the crankshaft. Front- and rear-mounted brackets.

Drawing: 2 017 566

DI16



FOR SALES INFORMATION ONLY



49A ENGINE SUSPENSION

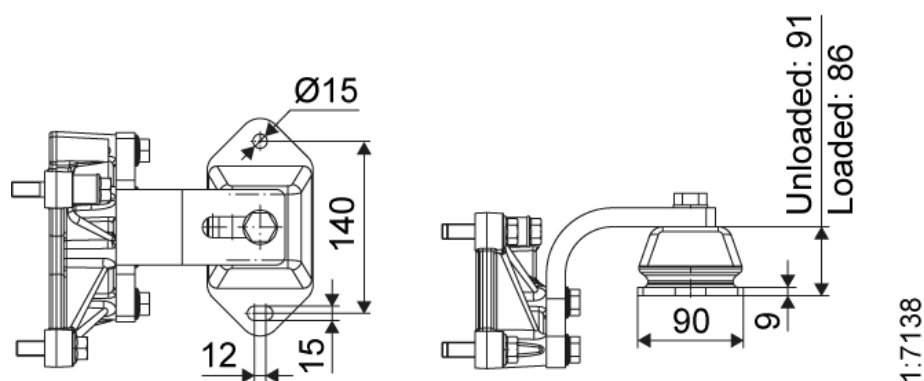
9-series, 13-series, 16-series

-01 O Stiff rubber suspension. Front Drawing: 1 866 025

DI9, DI13, DI16

-02 O Stiff rubber suspension. Front and rear Drawing: 1 866 025

DI9, DI13, DI16



FOR SALES INFORMATION ONLY



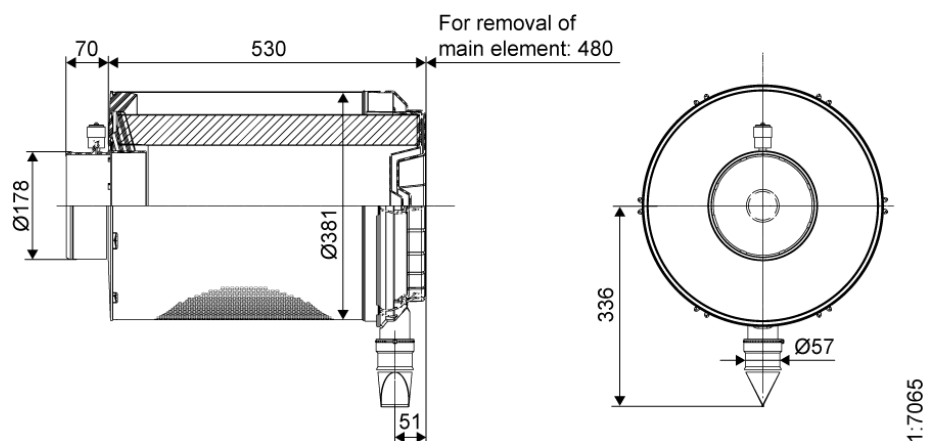
51 AIR CLEANER

9-series, 13-series

-05 O Light duty, Ø15". Separately.
Without hose.

Drawing: 1 925 175

DI9, DI13

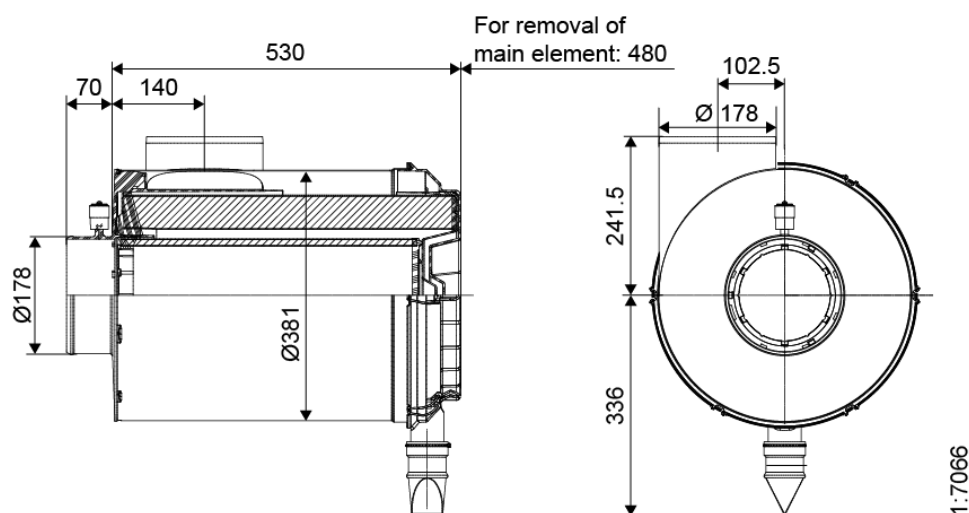


FOR SALES
INFORMATION ONLY

-08 O Medium duty, Ø15" incl. safety
element and pre-cleaner.
Separately. Without hose.

Drawing: 1 925 176

DI9, DI13

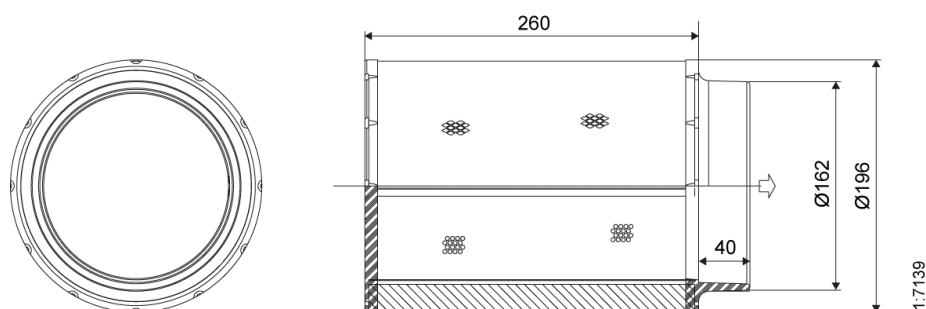


FOR SALES
INFORMATION ONLY

-10 O Light duty, Ø8". Mounted on the
turbo charger.

Drawing: 1 529 410

DI9, DI13

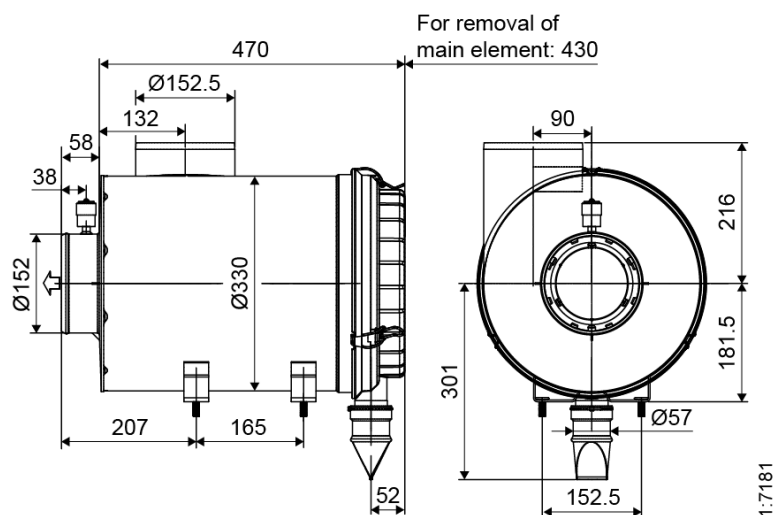


FOR SALES
INFORMATION ONLY



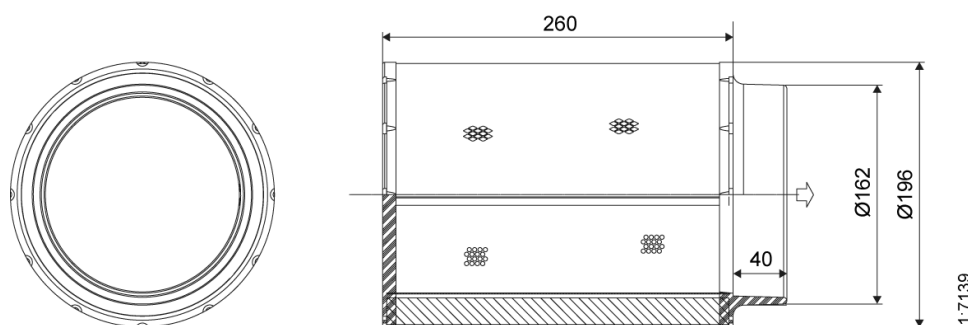
16-series

DI16



FOR SALES
INFORMATION ONLY

DI16



FOR SALES
INFORMATION ONLY



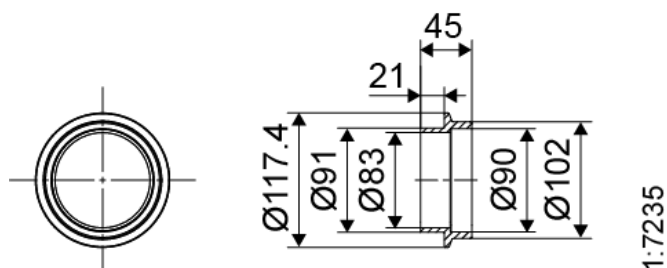
56 EXHAUST BEND

9-series

-01 S Without, but with turbo-mounted
flange

Drawing: 2 127 364

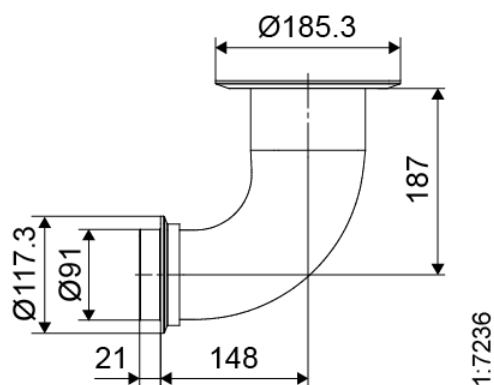
DI9



-02 O 90° bend, adjustable direction

Drawing: 2 127 364

DI9

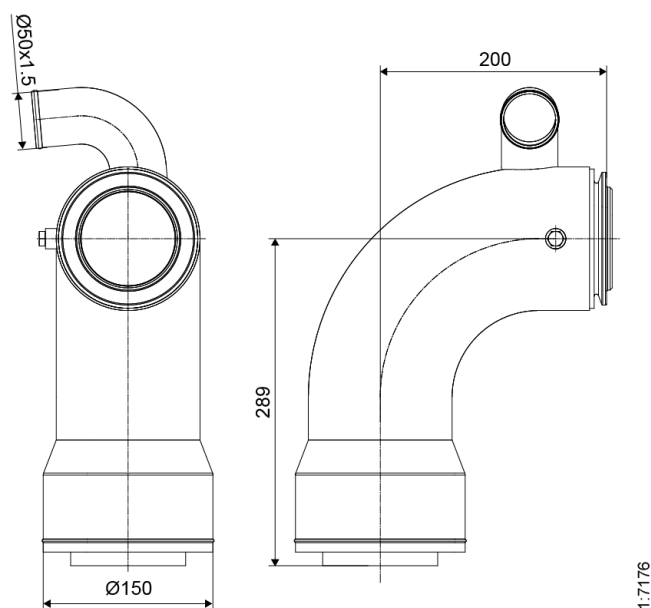


FOR SALES
INFORMATION ONLY

-06 O Water cooled, 90° bend, pointing
rearwards

Drawing: 2 033 702

DI9





56 EXHAUST BEND

13-series

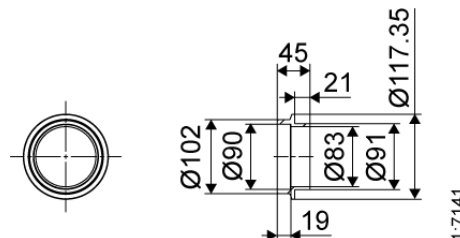
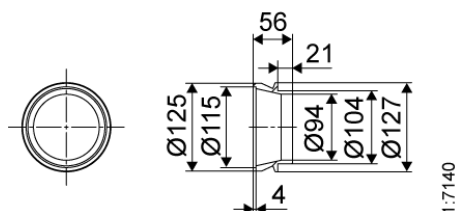
-01 S Without, but with turbo-mounted
flange

Drawing: 1 866 302

DI13

DI13 072/077M

DI13 070/071/073/074/075/078M



FOR SALES INFORMATION ONLY

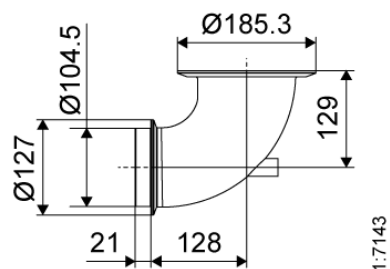
-02 O 90° bend, adjustable direction

Drawing: 1 866 302

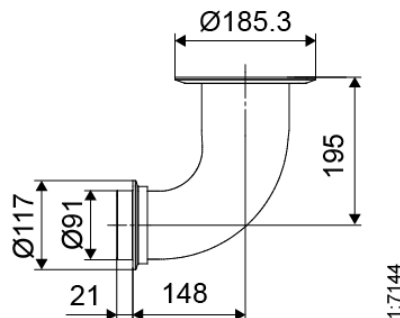
DI13

DI13 072/077M

DI13 070/071/073/074/075/078M



FOR SALES
INFORMATION ONLY



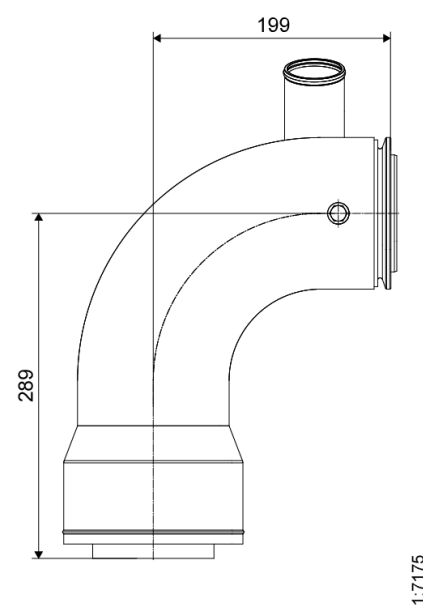
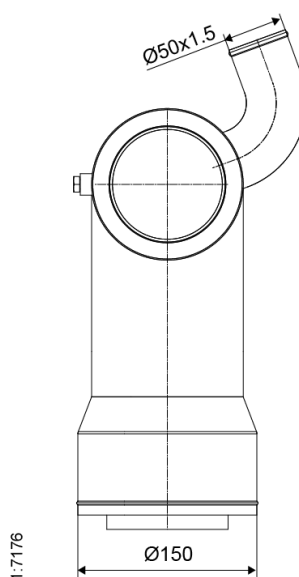
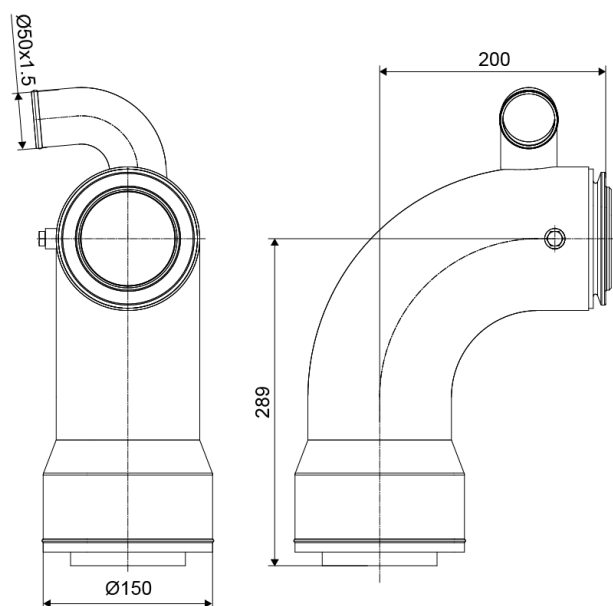
-06 O Water cooled, 90° bend, pointing
rearwards

Drawing: 1 866 201

DI13

DI13 070/071/074/075/078M

DI13 072/073/077M



FOR SALES INFORMATION ONLY

7A

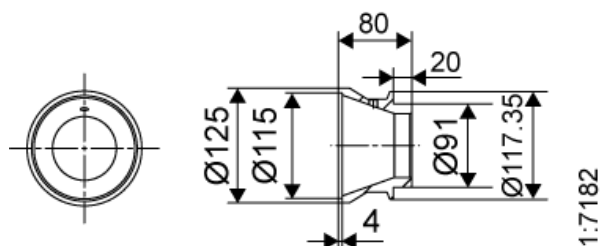


56 EXHAUST BEND

16-series

-01 S Without, but with turbo-mounted flange Drawing: 2 065 761

DI16

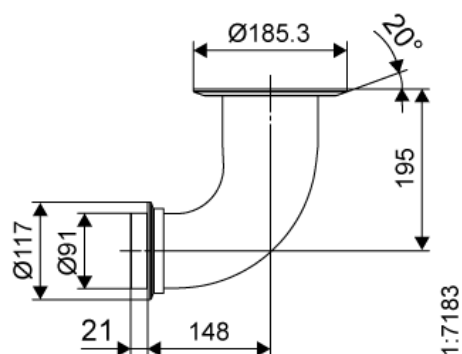


FOR SALES INFORMATION ONLY

-03 O 2 x 90° bend (dry)

Drawing: 2 065 761

DI16

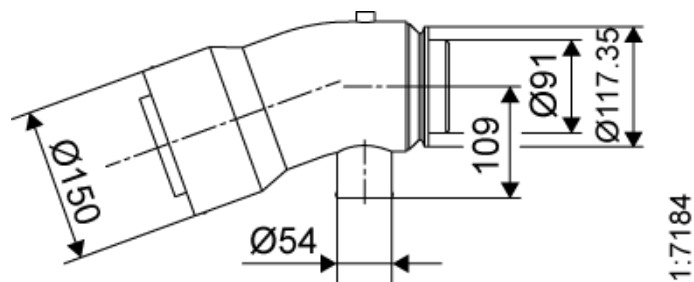


FOR SALES INFORMATION ONLY

-04 O 2 x Water cooled exhaust bends

Drawing: 2 065 761

DI16



FOR SALES INFORMATION ONLY



57 EXHAUST FITTINGS

9-series, 13-series

-02 O Flange, Ø130 mm

Drawing: 2 127 364

DI9

Drawing: 1 866 302

DI13

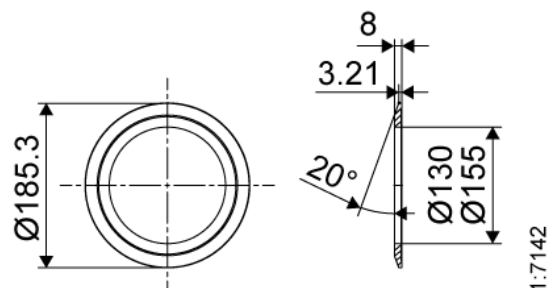
-03 O Flange, Ø155 mm

Drawing: 2 127 364

DI9

Drawing: 1 866 302

DI13



FOR SALES INFORMATION ONLY

-05 O Compensator and flange, Ø130 mm Drawing: 2 127 364

DI9

Drawing: 1 866 302

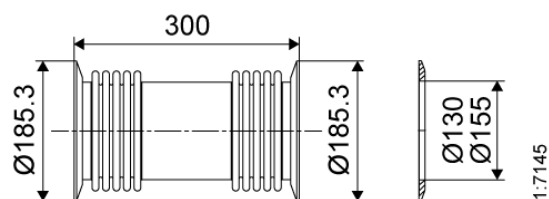
DI13

-06 O Compensator and flange, Ø155 mm Drawing: 2 127 364

DI9

Drawing: 1 866 302

DI13



FOR SALES INFORMATION ONLY

57 EXHAUST FITTINGS

16-series

-10 O Flange, 2 x Ø114 mm

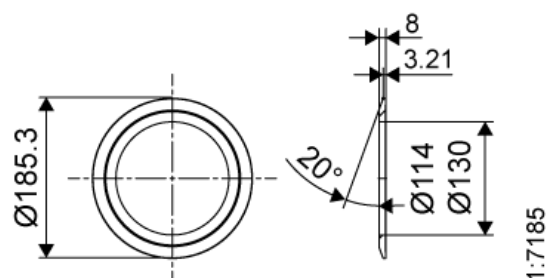
Drawing: 2 065 761

DI16

-11 O Flange, 2 x Ø130 mm

Drawing: 2 065 761

DI16



FOR SALES INFORMATION ONLY

-13 O Compensator and flange,
2 x Ø114 mm

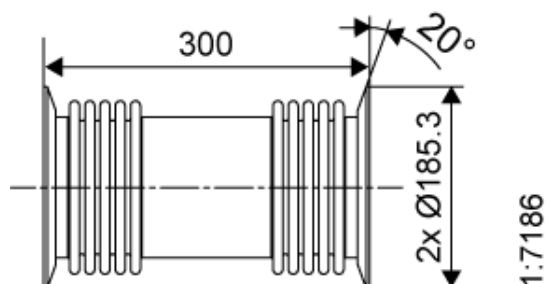
Drawing: 2 065 761

DI16

-14 O Compensator and flange,
2 x Ø130 mm

Drawing: 2 065 761

DI16



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INFORMATION ONLY

7A



7 EQUIPMENT DATA ref 60-99

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90 FRONT-MOUNTED POWER TAKE-OFF (PTO)	30
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Information about this section

This section is intended as a complement to the Engine data sections with additional information about engine equipment such as technical data, measurements and illustrations. Note that if a certain equipment does not have any additional information, other than that in the Engine data sections, it is not found in this section.

In association with each ordering reference the engine series, for which the equipment is intended, is stated.

Note! All conditions and requirements when ordering and combining equipment are stated in the Engine data sections 4-6 and are to be used when specifying your order.

S = Standard equipment

O = Optional equipment

Dimensions on sketches

The sketches are intended for sales information only and must not be used for installation purposes as drawings could have been updated without notice. Before dimensioning any installation, please refer to the latest issue of a valid Scania drawing. All drawings can be ordered from Scania (via Pre-sales FRAS) with short notice and will be delivered free of charge.

Installation manual

If you need more information related to your installation than you find in the Data Handbook, we refer to the installation manual (<http://til.scania.com>). Below you can what sections and information you find in the installation manual:

1 Industrial and Generator engines

- 1:01 Engine
- 1:02 Intake system and ventilation
- 1:03 Fuel system
- 1:04 Exhaust system
- 1:05 Cooling system
- 1:06 Technical data
- 1:07 SCR-system
- 1:08 Measuring instructions for installation inspection

2 Marine engines

- 2:01 Engine
- 2:02 Intake system and ventilation
- 2:03 Fuel system
- 2:04 Exhaust system
- 2:05 Cooling system
- 2:06 Technical data
- 2:08 Measuring instructions for installation inspection

3 Electrical equipment

- 3:01 General electrical
- 3:02 Electrical systems
- 3:03 Instrumentation 2.0
- 3:05 CAN interface
- 3:10 Fault codes DM 1 XPI S8



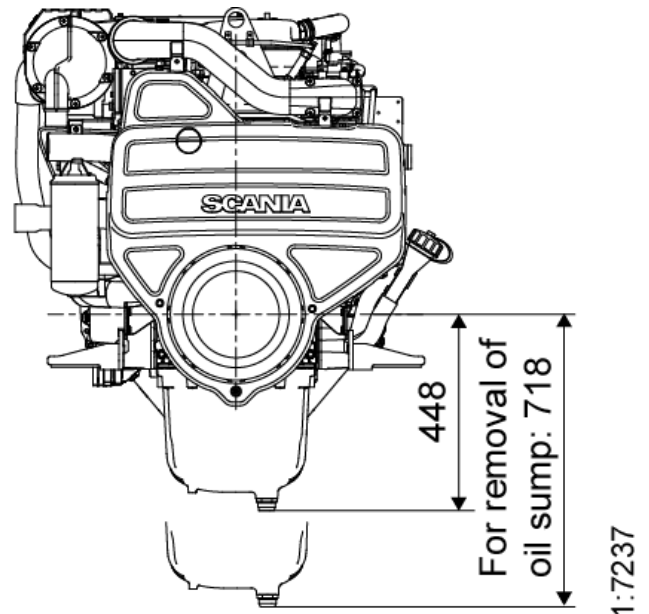
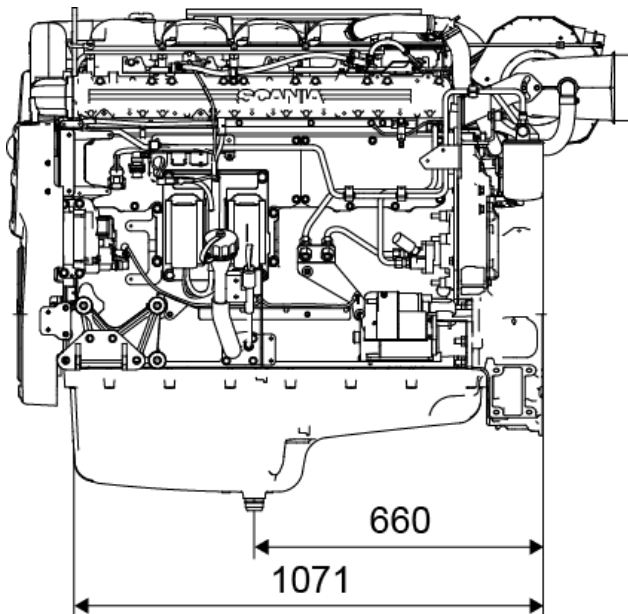
60 OIL SUMP

9-series

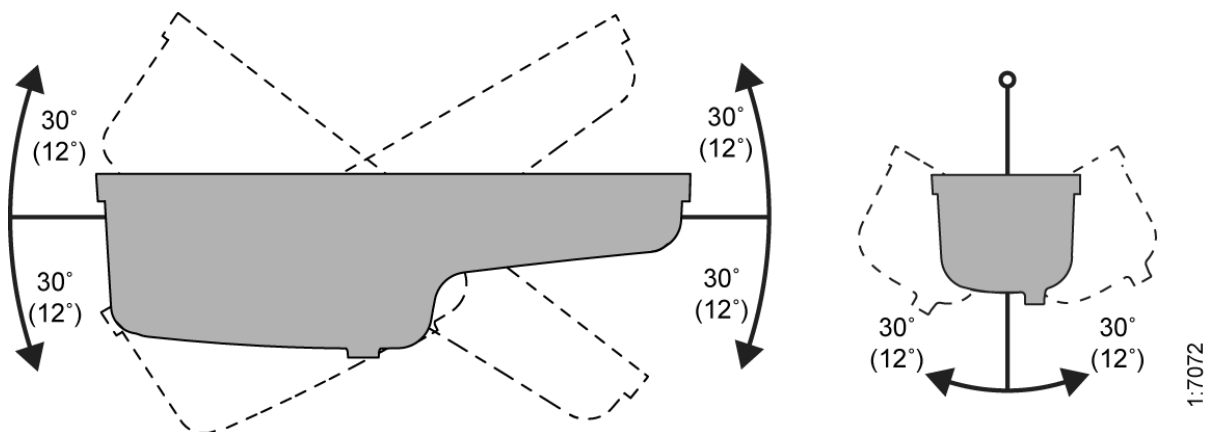
-01 S Deep front oil sump

Drawing: 2 134 590

D19



FOR SALES INFORMATION ONLY



Max angle	Engine rear down	Engine front down	Right/left	Volume
Installation:	12°	12°	12°	Min: 32 litres
Operation:	30°	30°	30°	Max: 38 litres

The above numbers indicate max installation and operation angles for an engine with this oil sump.
Max. inclination for an engine in operation counts where the engine lubrication still works with minimum oil level. The maximum operation angle should only be utilized for short periods. Specified maximum operation angles do not apply when the engine also is inclined sideways.



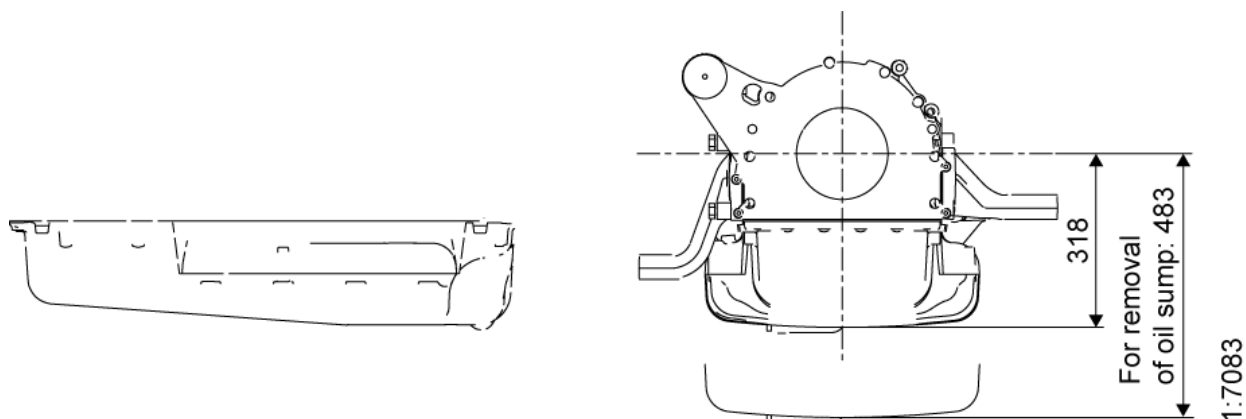
60 OIL SUMP

9-series

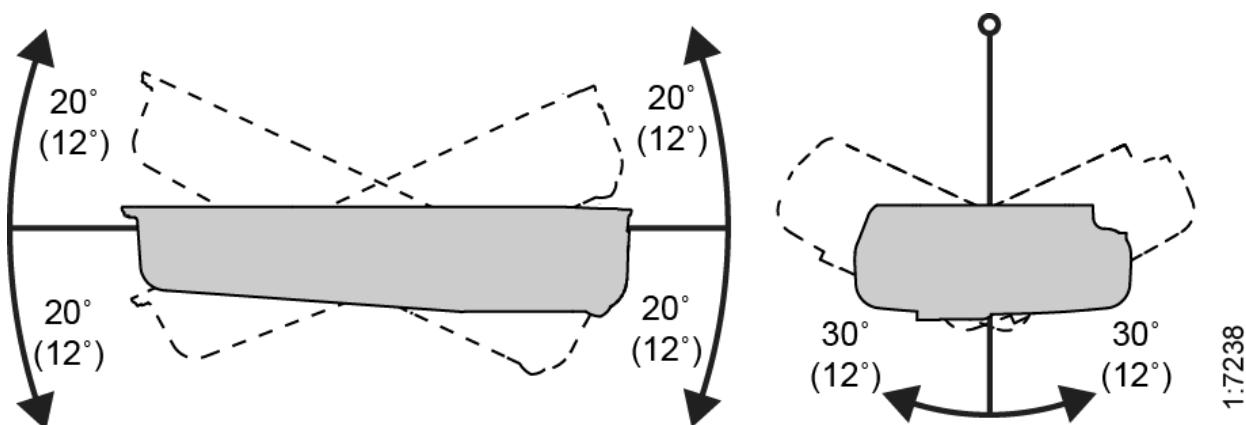
-02 O Low oil sump

Drawing: 1 927 084

DI9



FOR SALES INFORMATION ONLY



Max angle	Engine rear down	Engine front down	Right/left	Volume
Installation:	12°	12°	12°	Min: 25 litres
Operation:	20°	20°	30°	Max: 32 litres

The above numbers indicate max installation and operation angles for an engine with this oil sump.

Max. inclination for an engine in operation counts where the engine lubrication still works with minimum oil level. The maximum operation angle should only be utilized for short periods. Specified maximum operation angles do not apply when the engine also is inclined sideways.



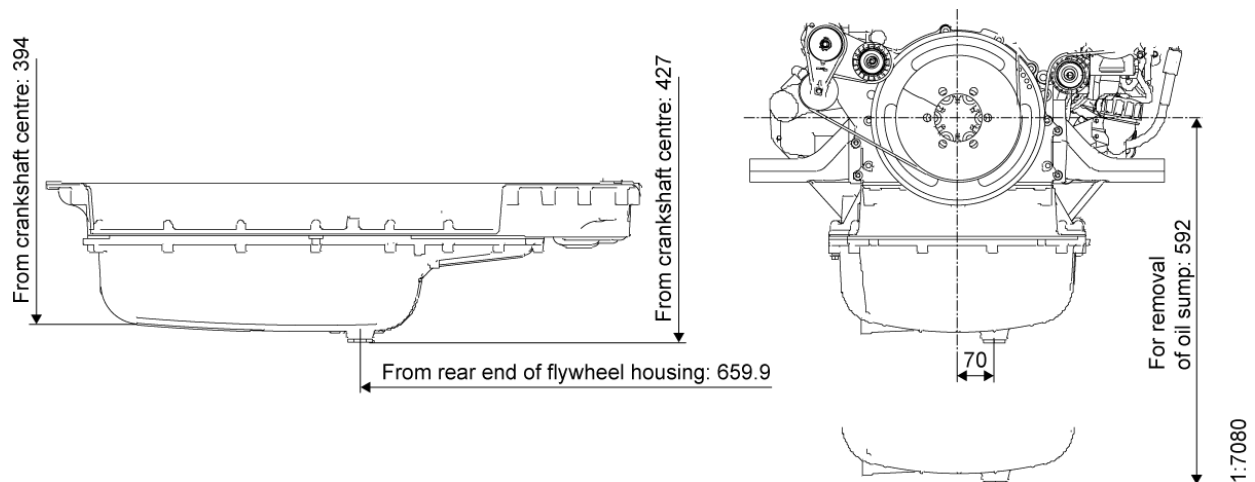
60 OIL SUMP

13-series

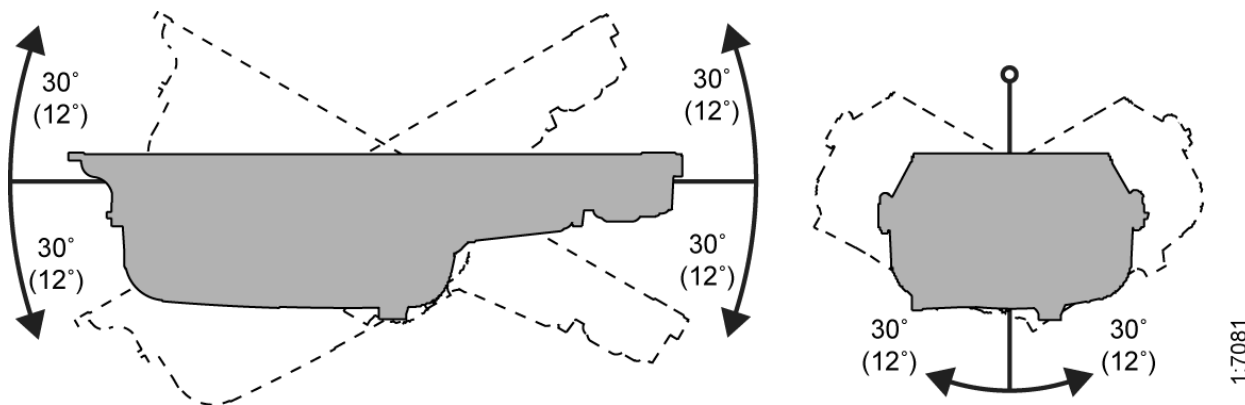
-01AS Deep front oil sump

Drawing: 1 927 084

DI13



FOR SALES INFORMATION ONLY



7_B

Max angle	Engine rear down	Engine front down	Right/left	Volume
Installation:	12°	12°	12°	Min: 39 litres
Operation:	30°	30°	30°	Max: 45 litres

The above numbers indicate max installation and operation angles for an engine with this oil sump. Max. inclination for an engine in operation counts where the engine lubrication still works with minimum oil level. The maximum operation angle should only be utilized for short periods. Specified maximum operation angles do not apply when the engine also is inclined sideways.



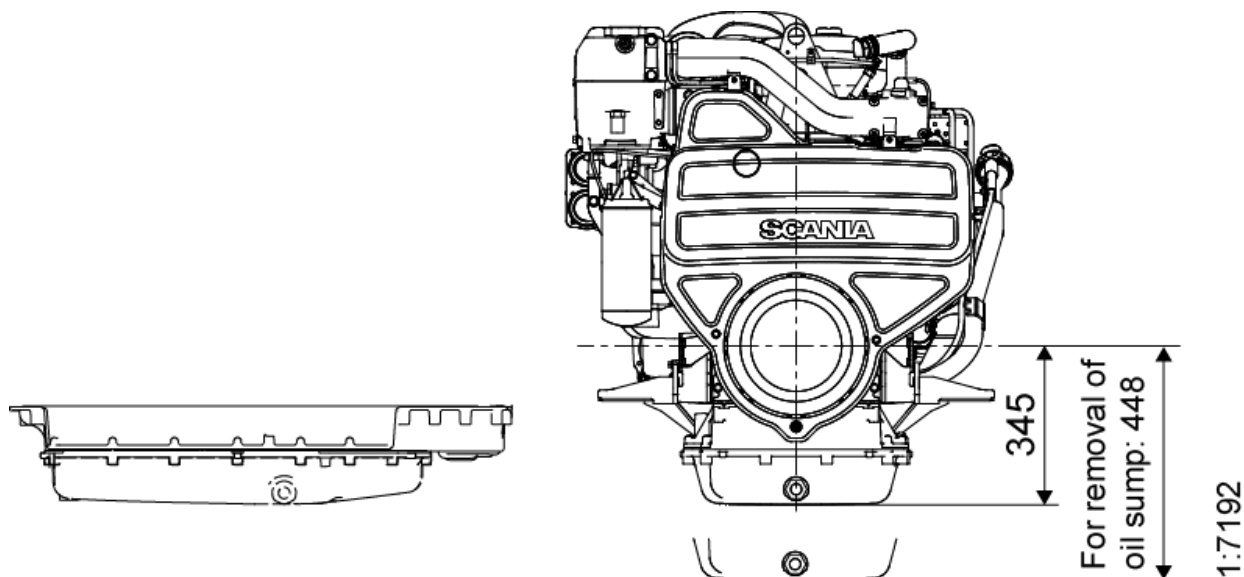
60 OIL SUMP

13-series

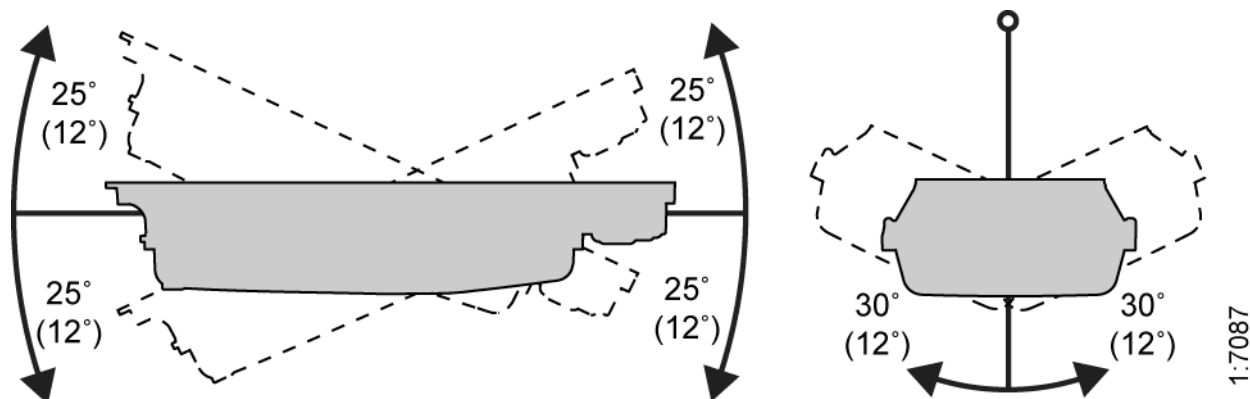
-03BO Low oil sump

Drawing: 1 866 386

DI13



FOR SALES INFORMATION ONLY



Max angle	Engine rear down	Engine front down	Right/left	Volume
Installation:	12°	12°	12°	Min: 28 litres
Operation:	25°	25°	30°	Max: 34 litres

The above numbers indicate max installation and operation angles for an engine with this oil sump.

Max. inclination for an engine in operation counts where the engine lubrication still works with minimum oil level. The maximum operation angle should only be utilized for short periods. Specified maximum operation angles do not apply when the engine also is inclined sideways.



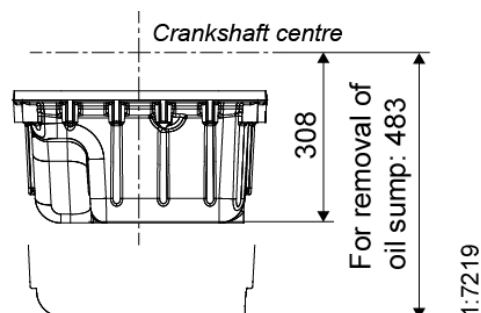
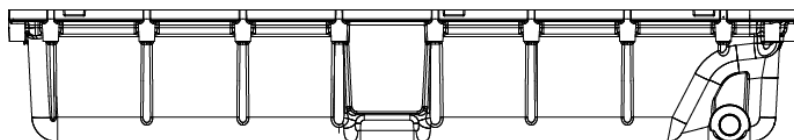
60 OIL SUMP

13-series

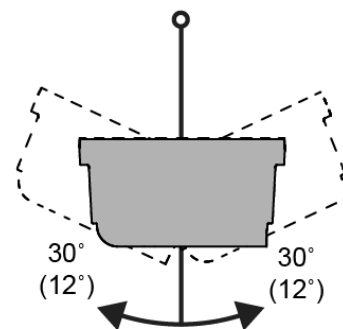
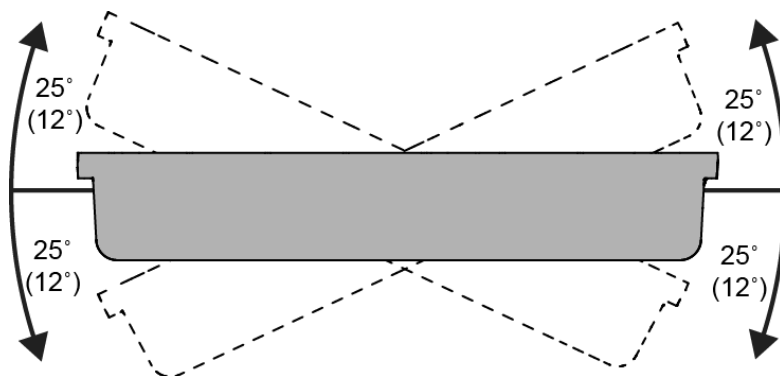
-04AO Extra low oil sump

Drawing: 2 122 395

DI13



FOR SALES INFORMATION ONLY



7_B

Max angle	Engine rear down	Engine front down	Right/left	Volume
Installation:	12°	12°	12°	Min: 25 litres
Operation:	25°	25°	30°	Max: 30 litres

The above numbers indicate max installation and operation angles for an engine with this oil sump.

Max. inclination for an engine in operation counts where the engine lubrication still works with minimum oil level. The maximum operation angle should only be utilized for short periods. Specified maximum operation angles do not apply when the engine also is inclined sideways.



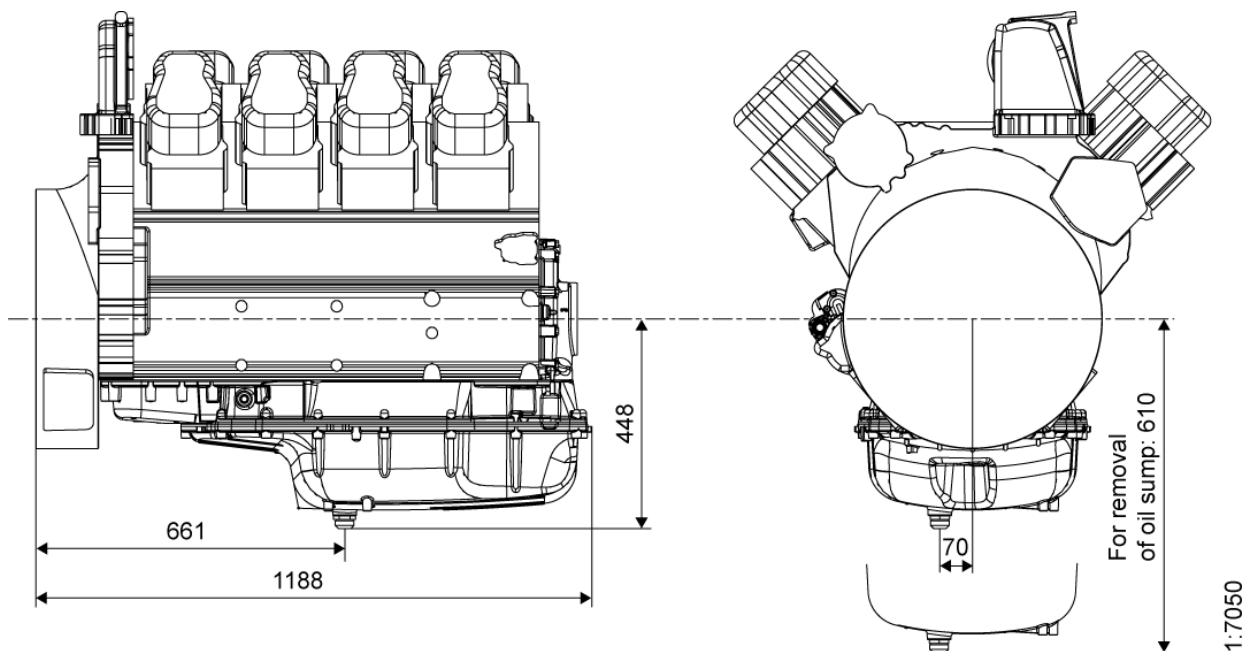
60 OIL SUMP

16-series

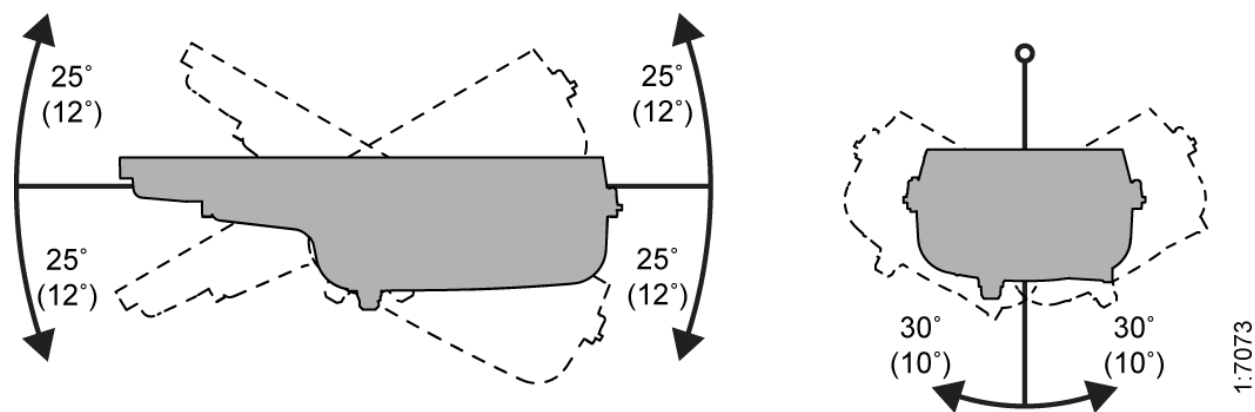
-01 S Deep front oil sump

Drawing: 1 825 009

DI16



FOR SALES INFORMATION ONLY



Max angle	Engine rear down	Engine front down	Right/left	Volume
Installation:	12°	12°	10°	Min: 40 litres
Operation:	25°	25°	30°	Max: 48 litres

The above numbers indicate max installation and operation angles for an engine with this oil sump.

Max. inclination for an engine in operation counts where the engine lubrication still works with minimum oil level. The maximum operation angle should only be utilized for short periods. Specified maximum operation angles do not apply when the engine also is inclined sideways.



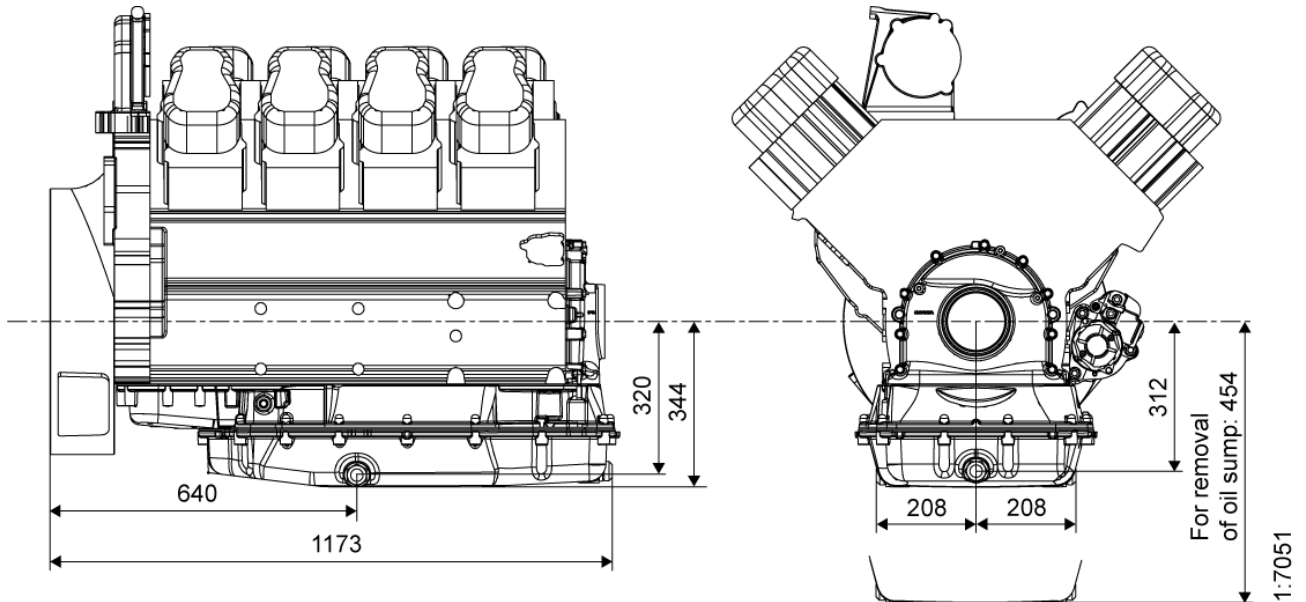
60 OIL SUMP

16-series

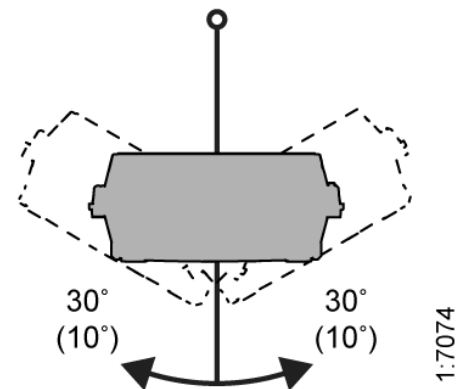
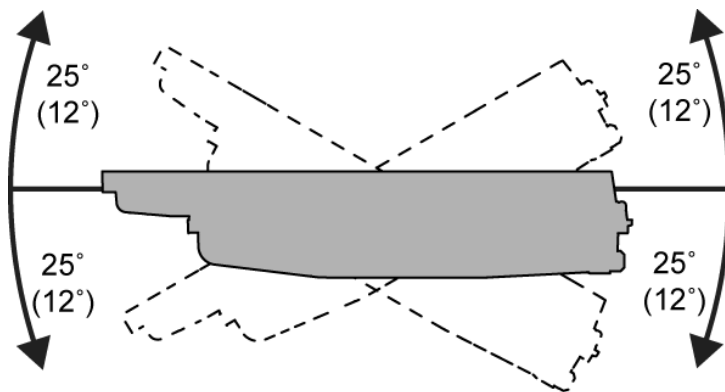
-03 O Low oil sump with ladder frame

Drawing: 1 825 009

D116



FOR SALES INFORMATION ONLY



7_B

Max angle	Engine rear down	Engine front down	Right/left	Volume
Installation:	12°	12°	10°	Min: 29 litres
Operation:	25°	25°	30°	Max: 37 litres

The above numbers indicate max installation and operation angles for an engine with this oil sump.

Max. inclination for an engine in operation counts where the engine lubrication still works with minimum oil level. The maximum operation angle should only be utilized for short periods. Specified maximum operation angles do not apply when the engine also is inclined sideways.



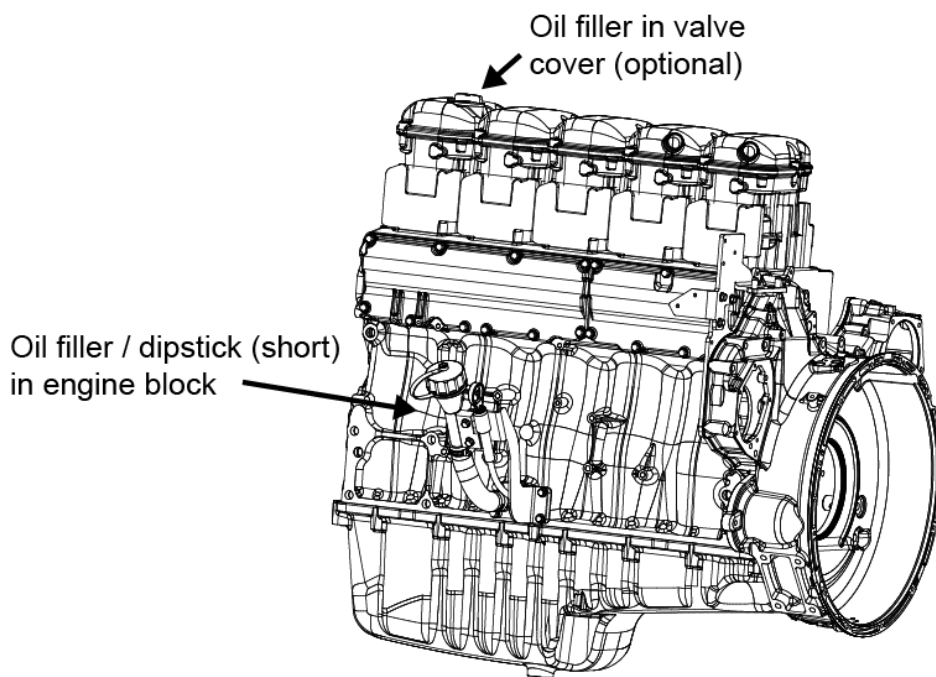
60A OIL DIPSTICK

9-series

-01 S Short, left hand side, in block

Drawing: 2 127 354

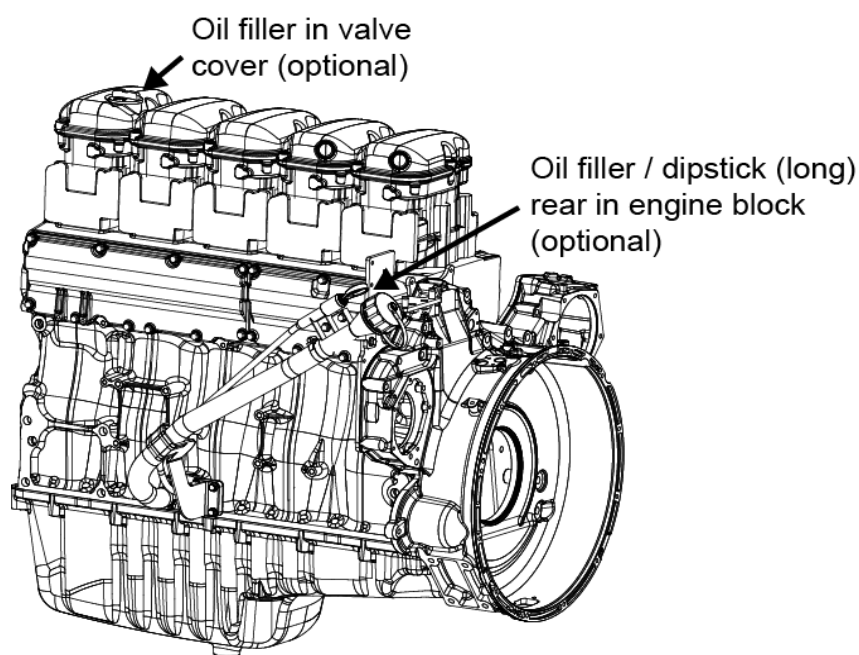
DI9



FOR SALES INFORMATION ONLY

-02 O Long, left hand side, rear in block. Drawing: 2 127 354

DI9



FOR SALES INFORMATION ONLY



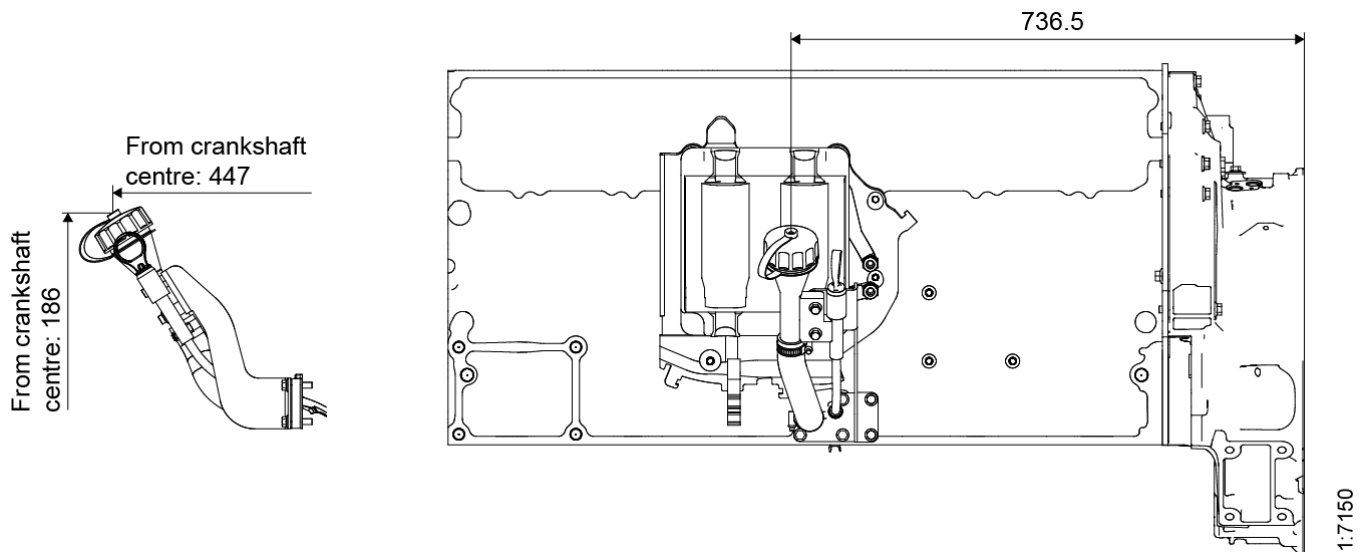
60A OIL DIPSTICK

13-series

-01 S Short, left hand side, in block

Drawing: 2 060 862

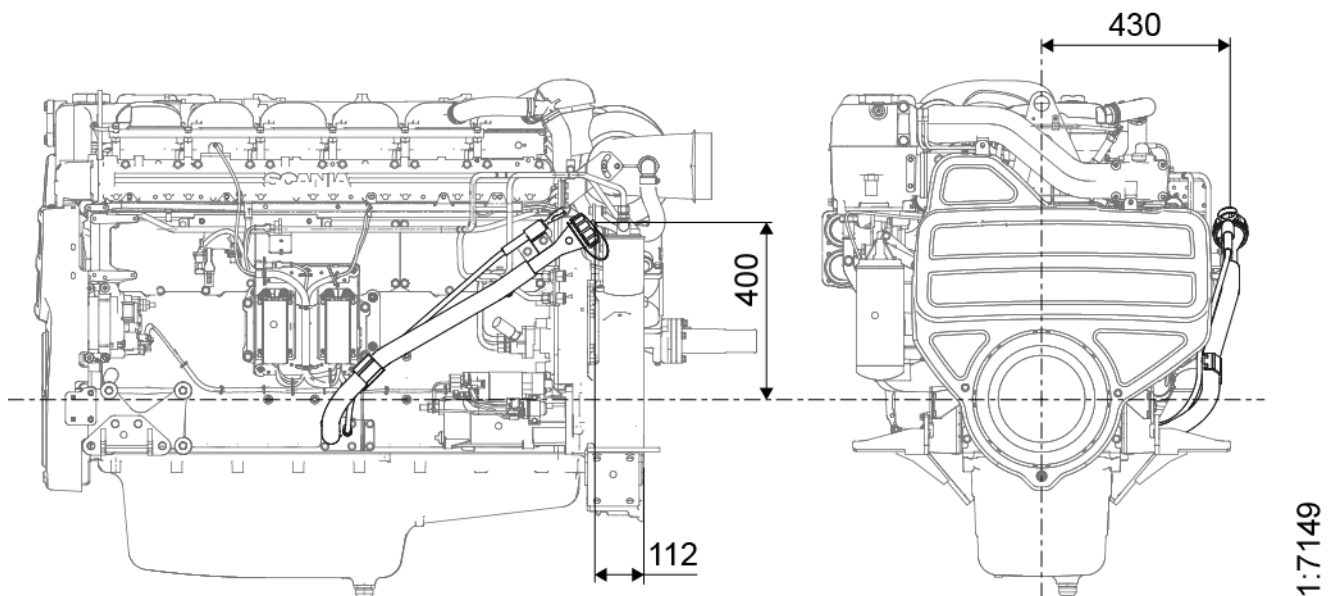
D113



FOR SALES INFORMATION ONLY

-02 O Long, left hand side, rear in block. Drawing: 1 866 386
Reachable from right hand side.

D113



FOR SALES INFORMATION ONLY



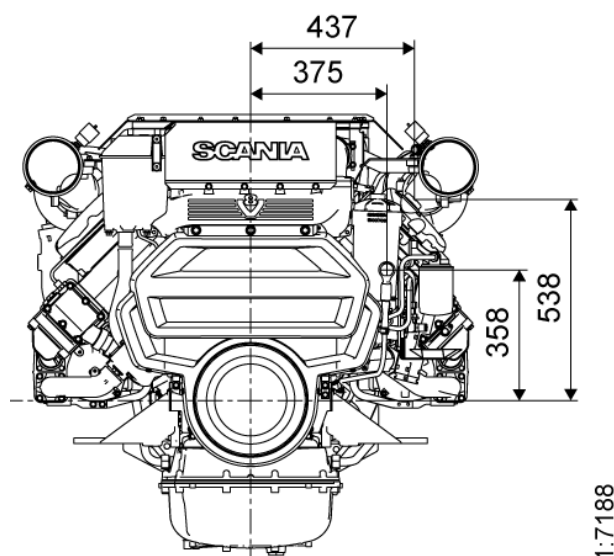
60A OIL DIPSTICK

16-series

-01 S Front of engine

Drawing: 2 103 570

DI16



FOR SALES INFORMATION ONLY

61 OIL FILLER

9-series

-01A S In engine block, left hand side

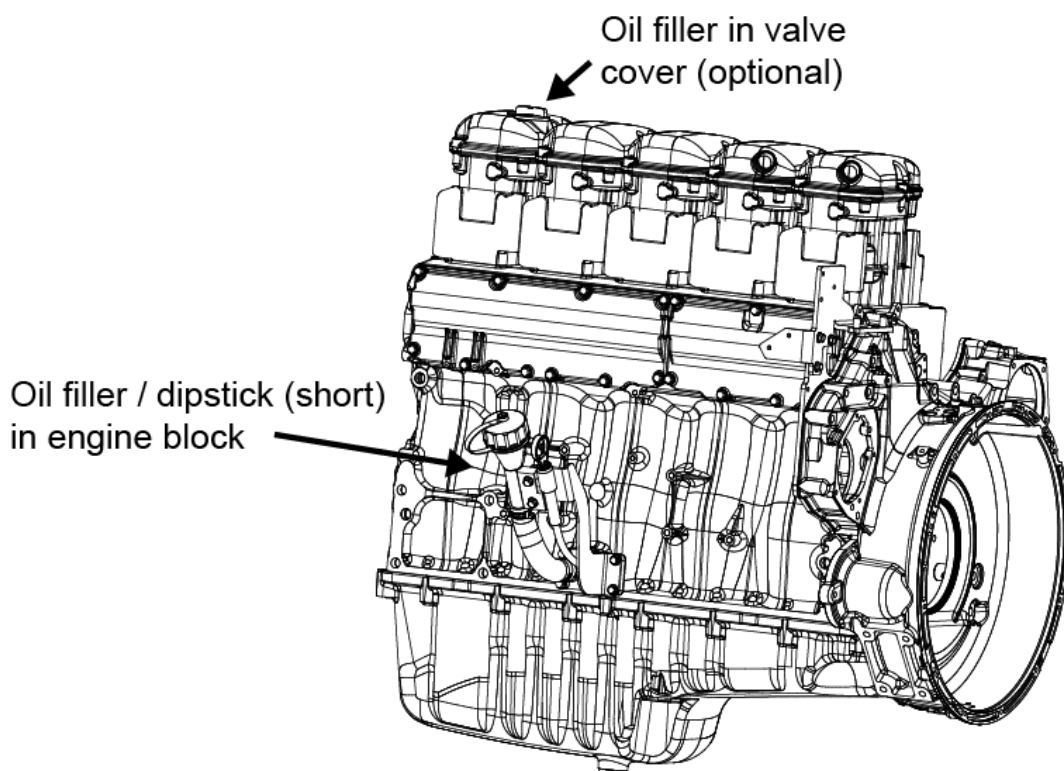
Drawing: 2 127 354

DI9

-01B O In valve cover, cyl 1, and engine block, left hand side

Drawing: 2 127 354

DI9



FOR SALES INFORMATION ONLY

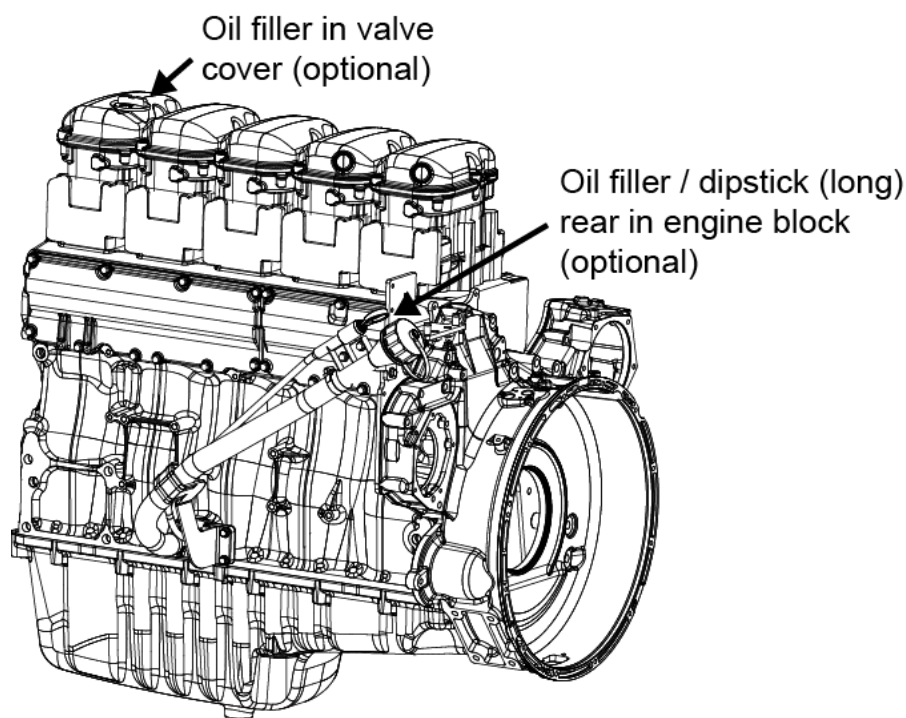


61 OIL FILLER

9-series

-05B O In valve cover, cyl 1, and engine block, rear left hand side
Drawing: 2 127 354

D19



FOR SALES INFORMATION ONLY

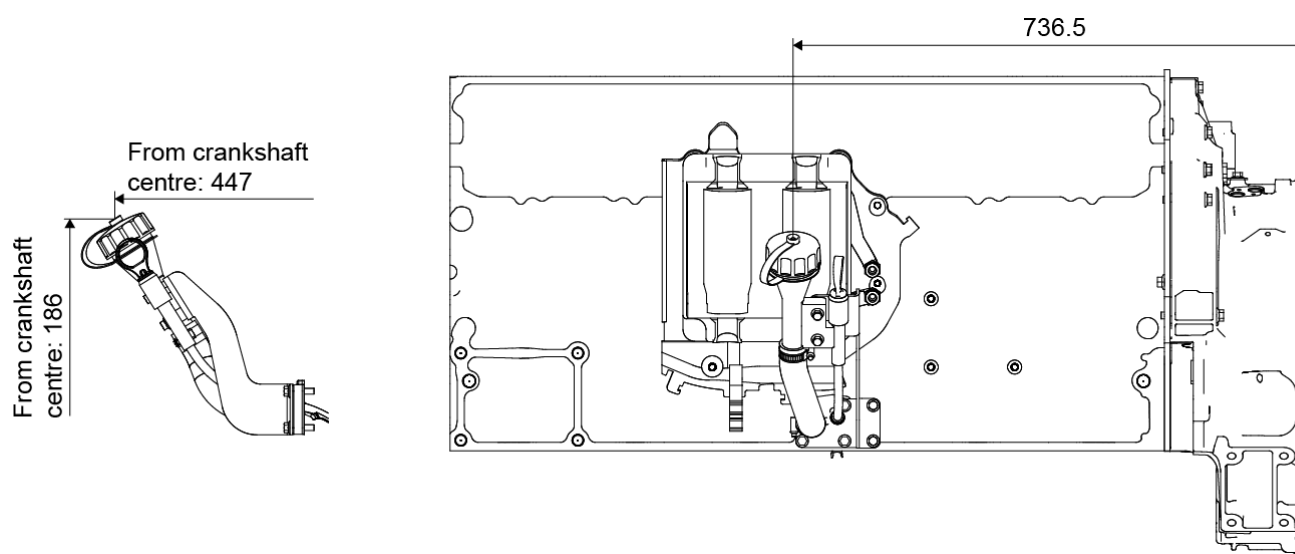
61 OIL FILLER

13-series

-01A S In engine block, left hand side
Drawing: 2 060 862
-01B O In valve cover, cyl 1, and engine block, left hand side
Drawing: 2 060 862

D113

D113



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7_B



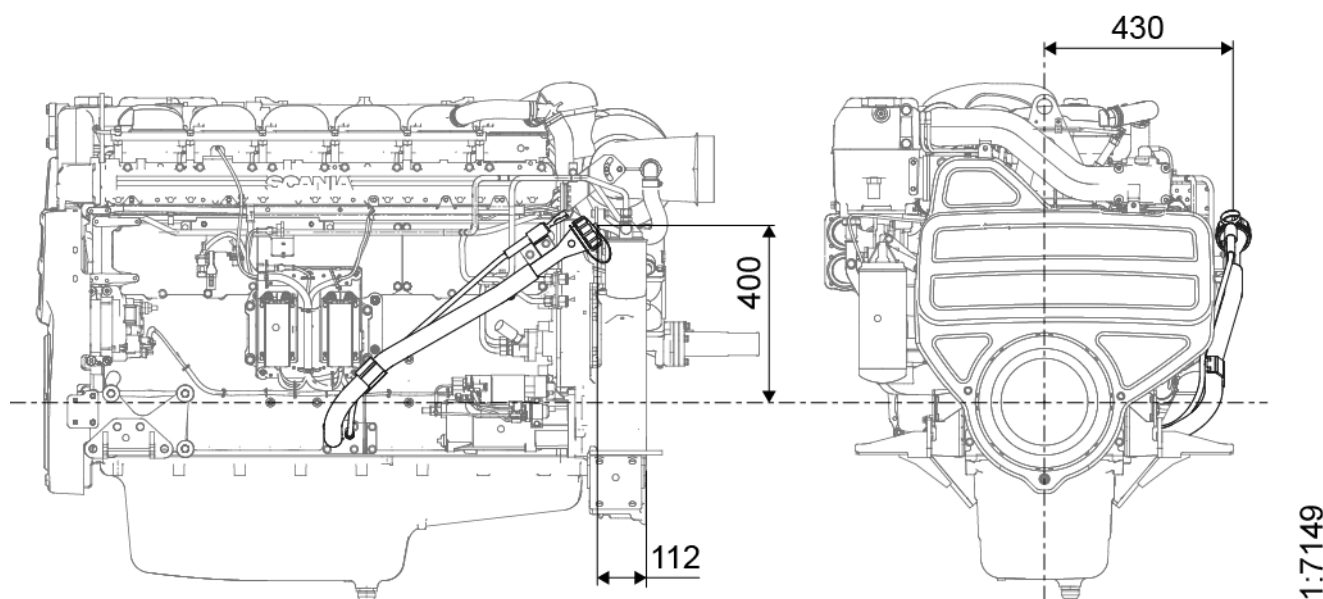
61 OIL FILLER

13-series

-05B O In valve cover, cyl 1, and engine
block, rear left hand side

Drawing: 1 866 386

DI13



FOR SALES INFORMATION ONLY

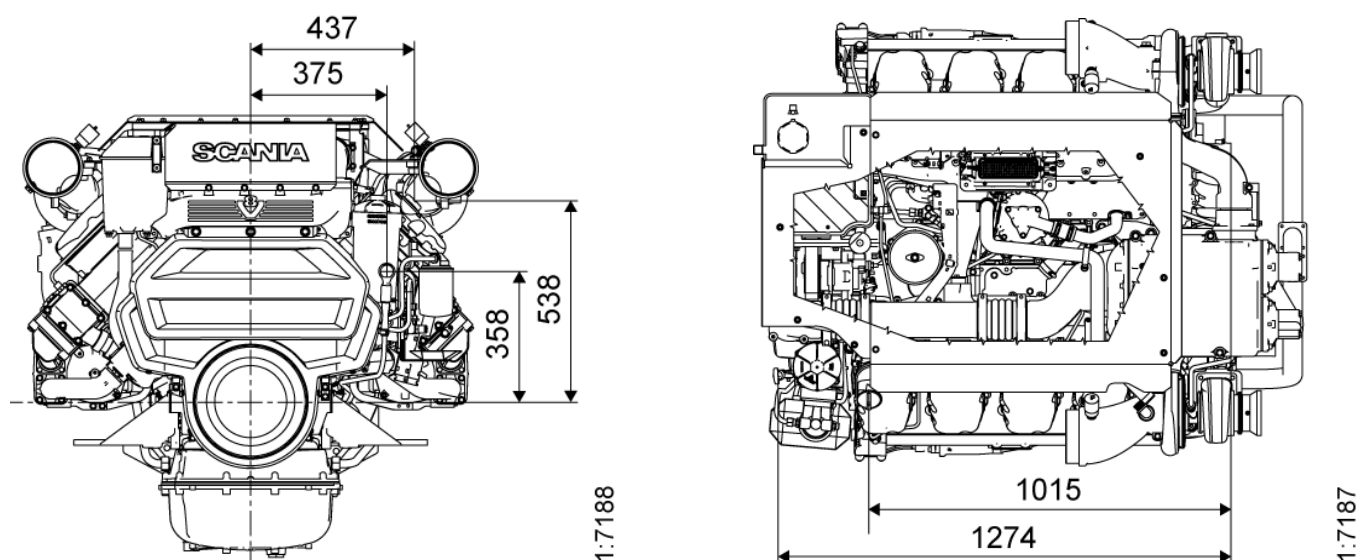
61 OIL FILLER

16-series

-01 S In valve cover

Drawing: 2 103 570

DI16



FOR SALES INFORMATION ONLY



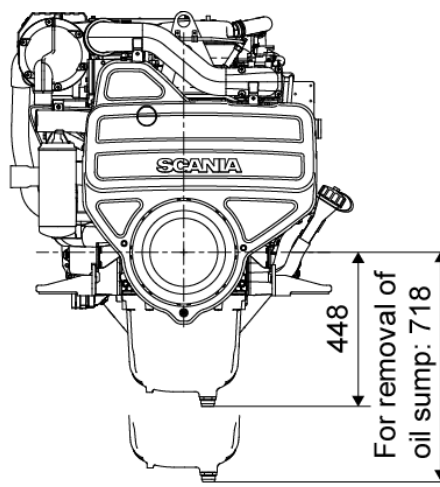
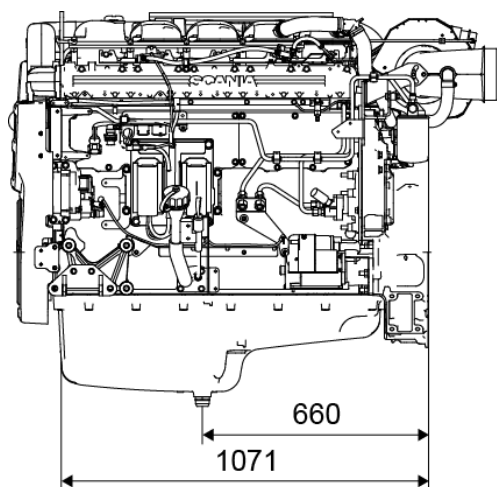
62 OIL DRAINING

9-series, 13-series, 16-series

-01 S With plug

Drawing: 2 134 590

D19



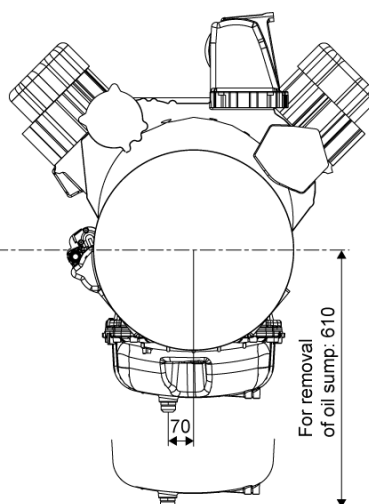
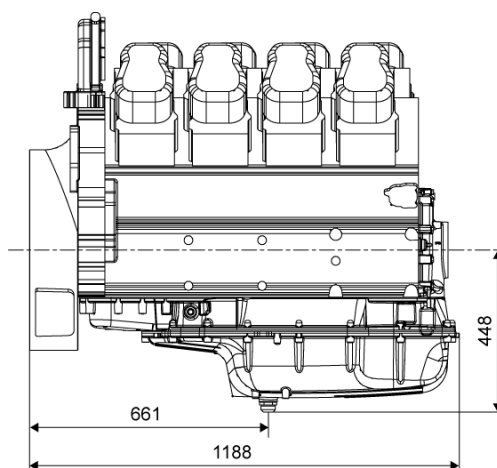
FOR SALES
INFORMATION ONLY

1:7237

-01 S With plug

Drawing: 1 825 009

D16



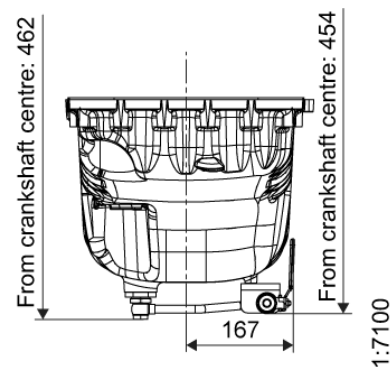
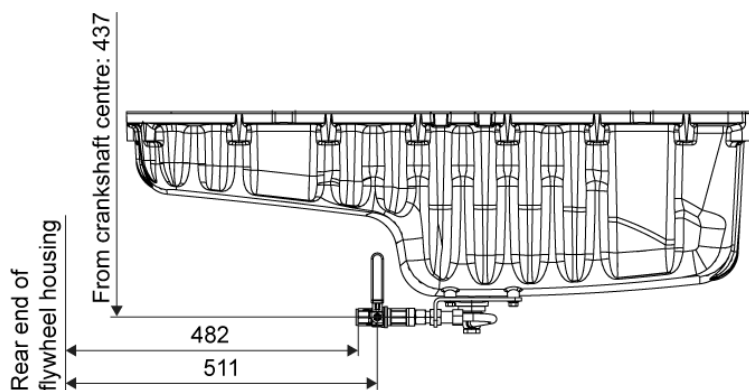
FOR SALES
INFORMATION ONLY

1:7050

-02 O With valve

Drawing: 2 012 121

D19



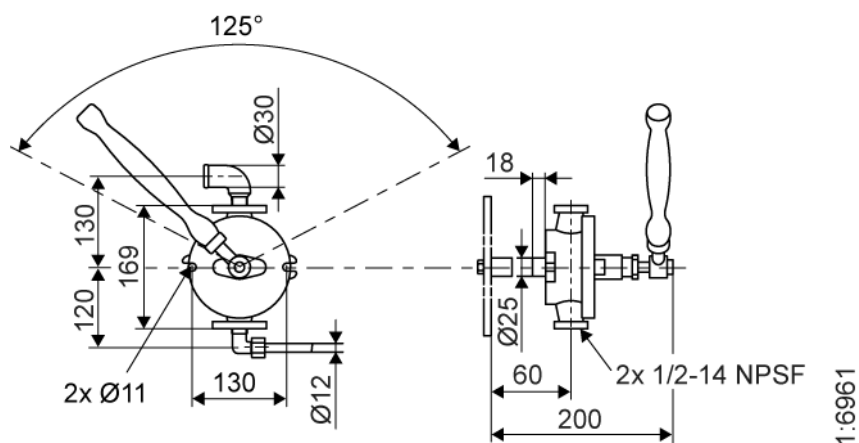
FOR SALES INFORMATION ONLY



62 OIL DRAINING

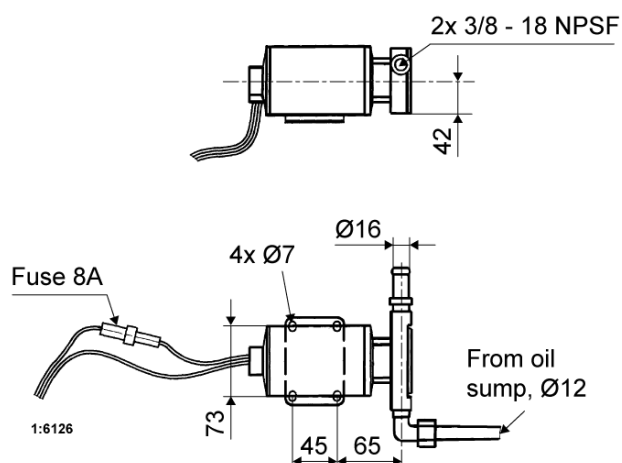
9-series, 13-series , 16-series

-03 O With hand pump, right hand side	Drawing: 1 859 126	DI9
	Drawing: 1 859 139	DI13
-04 O With hand pump, left hand side	Drawing: 1 859 126	DI9
	Drawing: 1 859 139	DI13
-03AO With hand pump, right hand side	Drawing: 1 825 226	DI16
-04AO With hand pump, left hand side	Drawing: 1 825 226	DI16

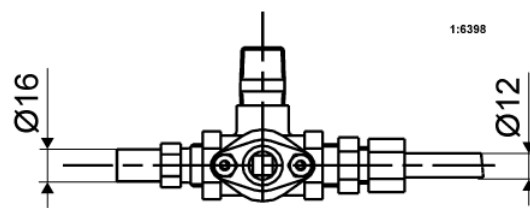


FOR SALES
INFORMATION ONLY

-05 O With electric pump and 3-way cock on right hand side	Drawing: 1 407 848	DI9, DI13, DI16
-06 O With electric pump and 3-way cock on left hand side	Drawing: 1 407 848	DI9, DI13, DI16



3-way cock



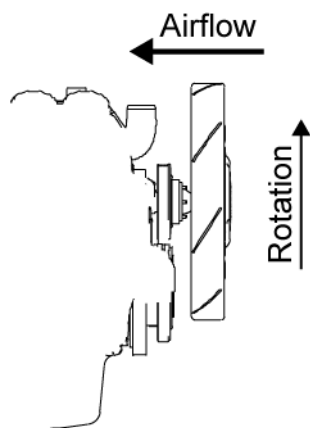
FOR SALES INFORMATION ONLY



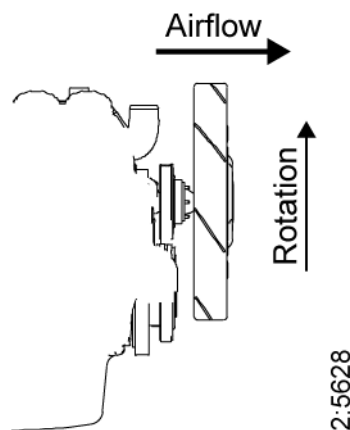
72 FAN

9-series, 13-series, 16-series

PULLER



PUSHER



-01 O Prepared for fan, ratio 1:0.9

Drawing: 1 861 092

Drawing: 1 927 865

DI9M, DI13M, Auxiliary engines only

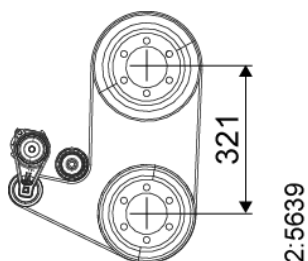
DI16M, Auxiliary engines only

-02 O Prepared for fan, ratio 1:1.1

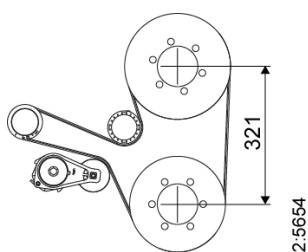
Drawing: 1 927 865

DI16M, Auxiliary engines only

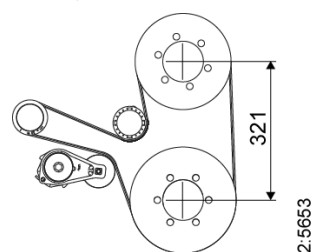
DI9/13, ratio 1:0.9



DI16, ratio 1:0.9



DI16, ratio 1:1.1



FOR SALES INFORMATION ONLY

7_B

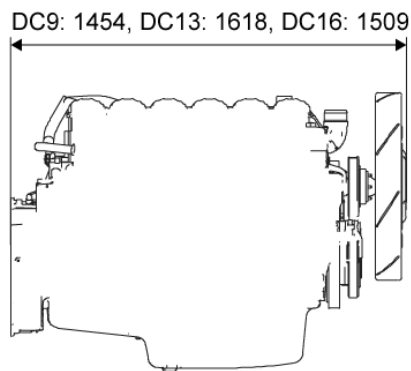
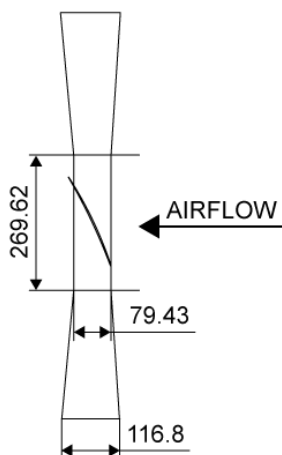
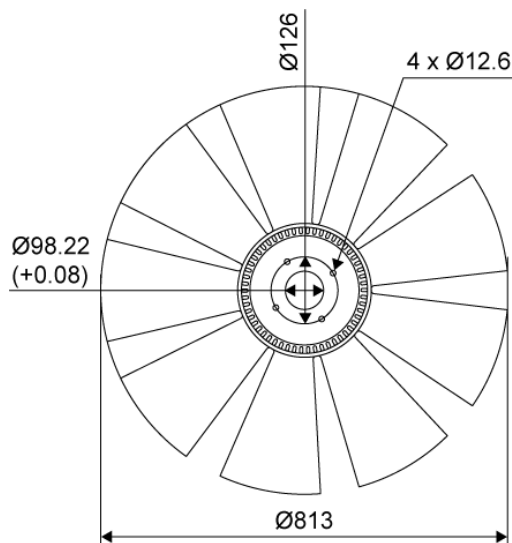


72 FAN

-12 O Pusher, Ø813 mm, ratio 1:0.9

Drawing: 1 918 482

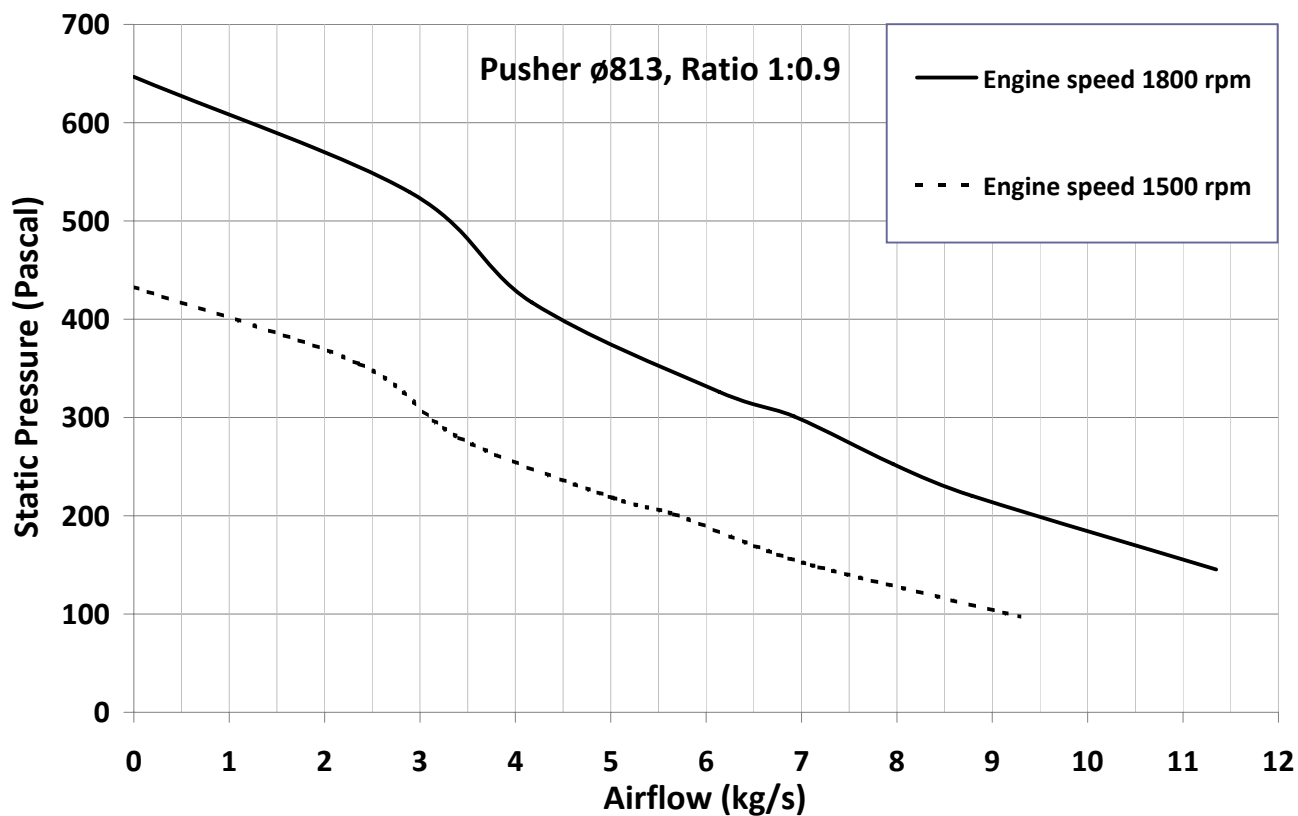
DI9, Auxiliary engines only



2:5631

FOR SALES INFORMATION ONLY

Engine speed (rpm)	1500	1800
Fan power (kW)	6	10



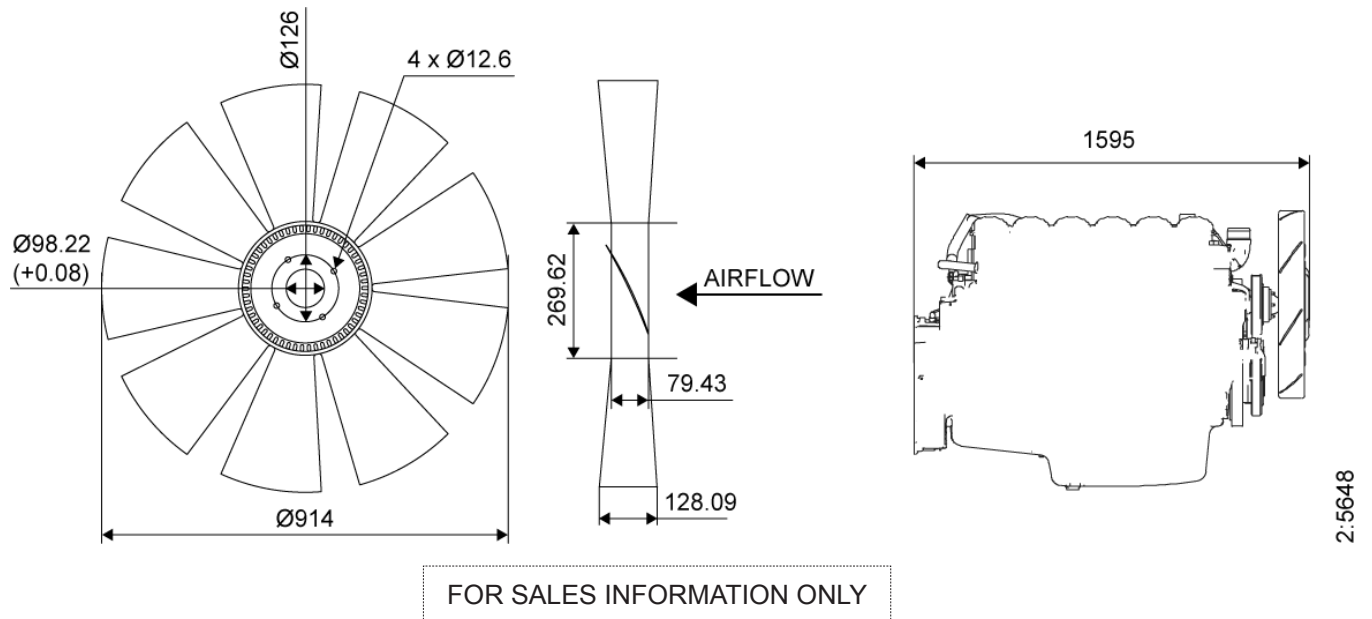


72 FAN

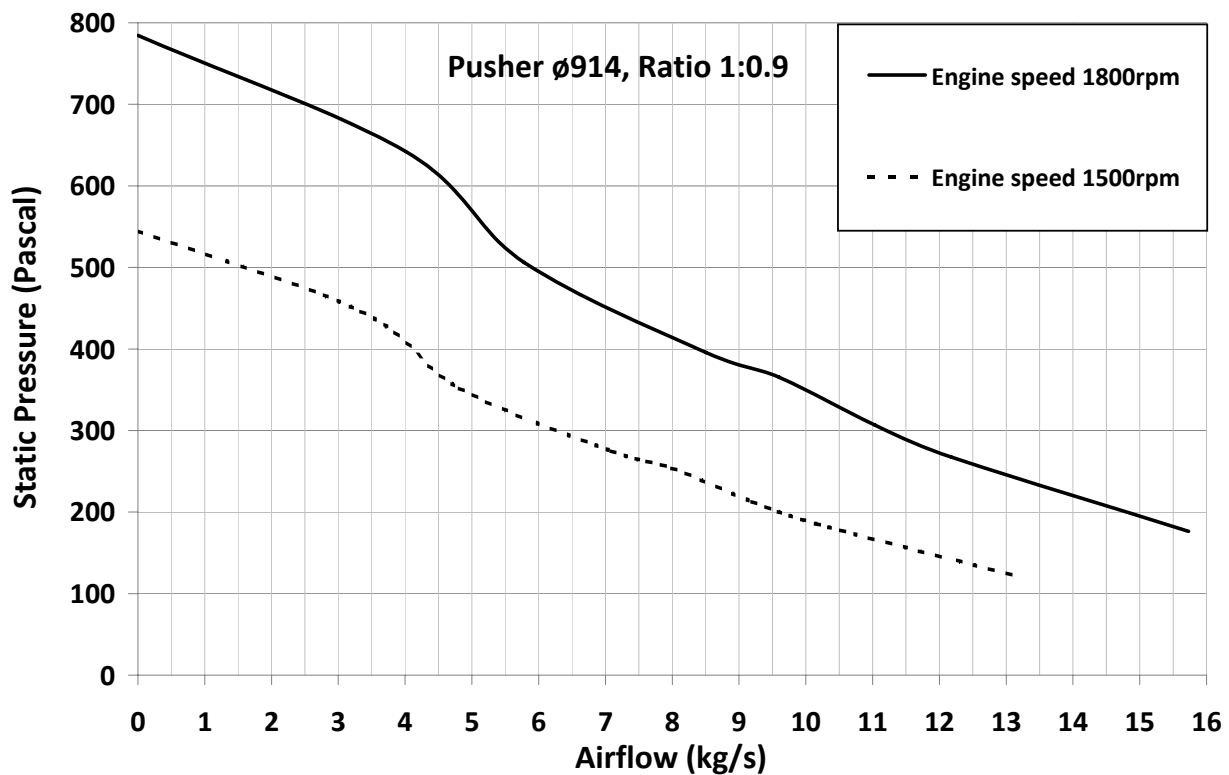
-15 O Pusher, Ø914 mm, ratio 1:0.9

Drawing: 1 918 483

DI13, Auxiliary engines only



Engine speed (rpm)	1500	1800
Fan power (kW)	10	17



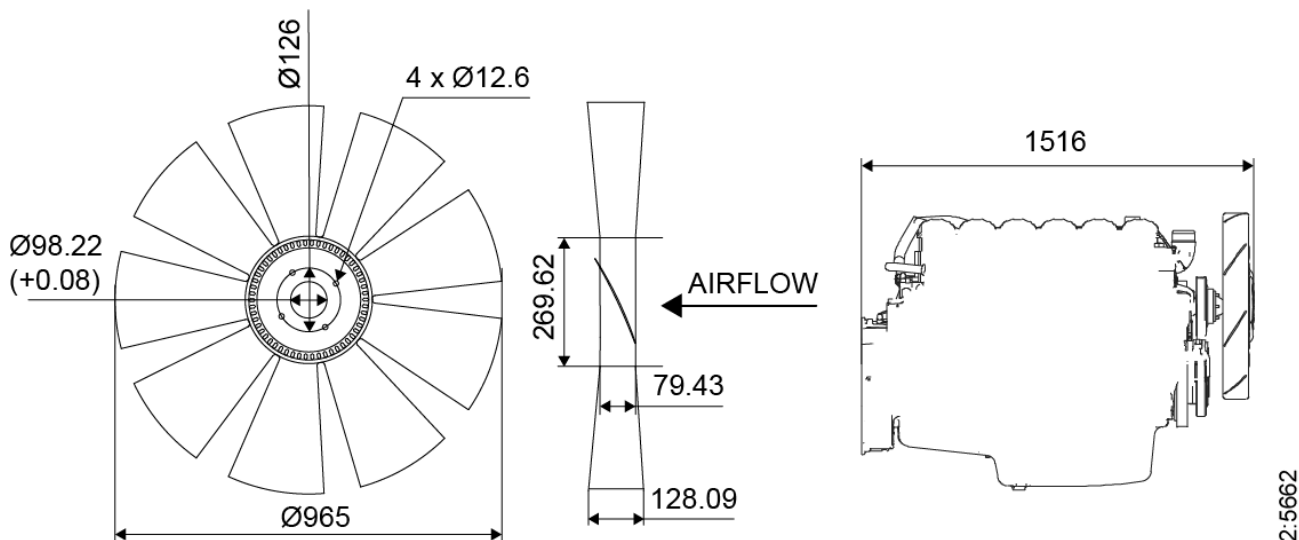


72 FAN

-16 O Pusher, Ø965 mm, ratio 1:0.9

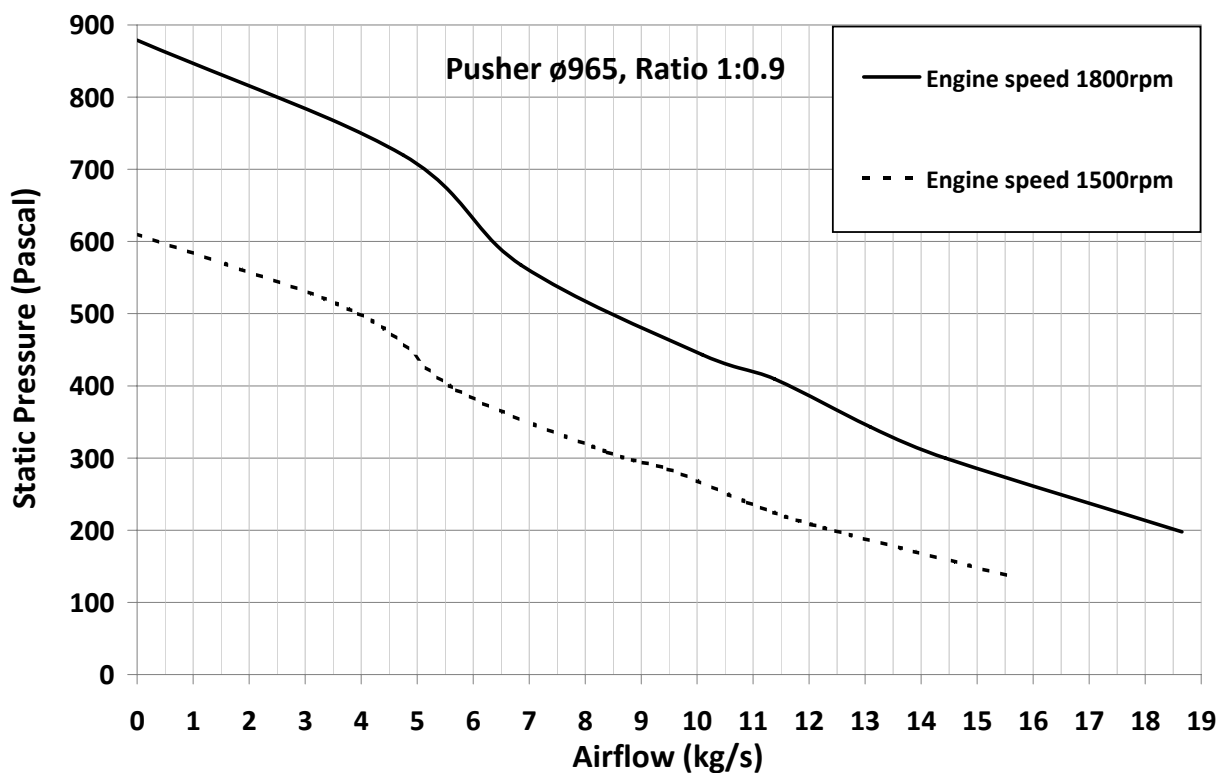
Drawing: 1 928 221

DI16, Auxiliary engines only



FOR SALES INFORMATION ONLY

Engine speed (rpm)	1500	1800
Fan power (kW)	13	23





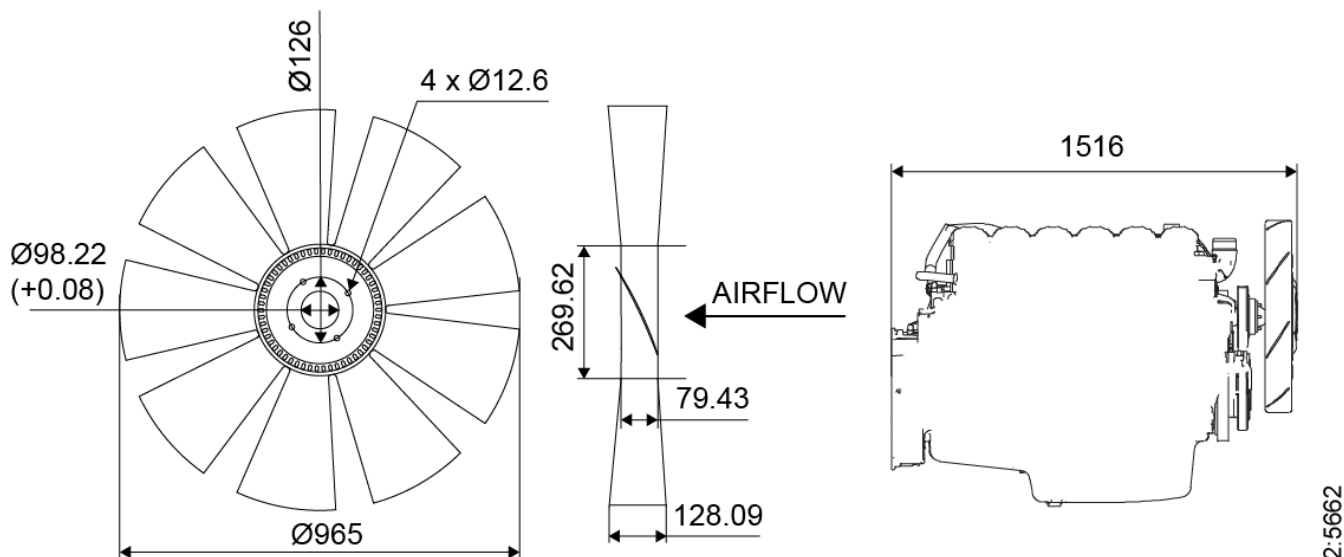
72 FAN

-17 O Pusher, Ø965 mm, ratio 1:1.1

Drawing: 1 928 221

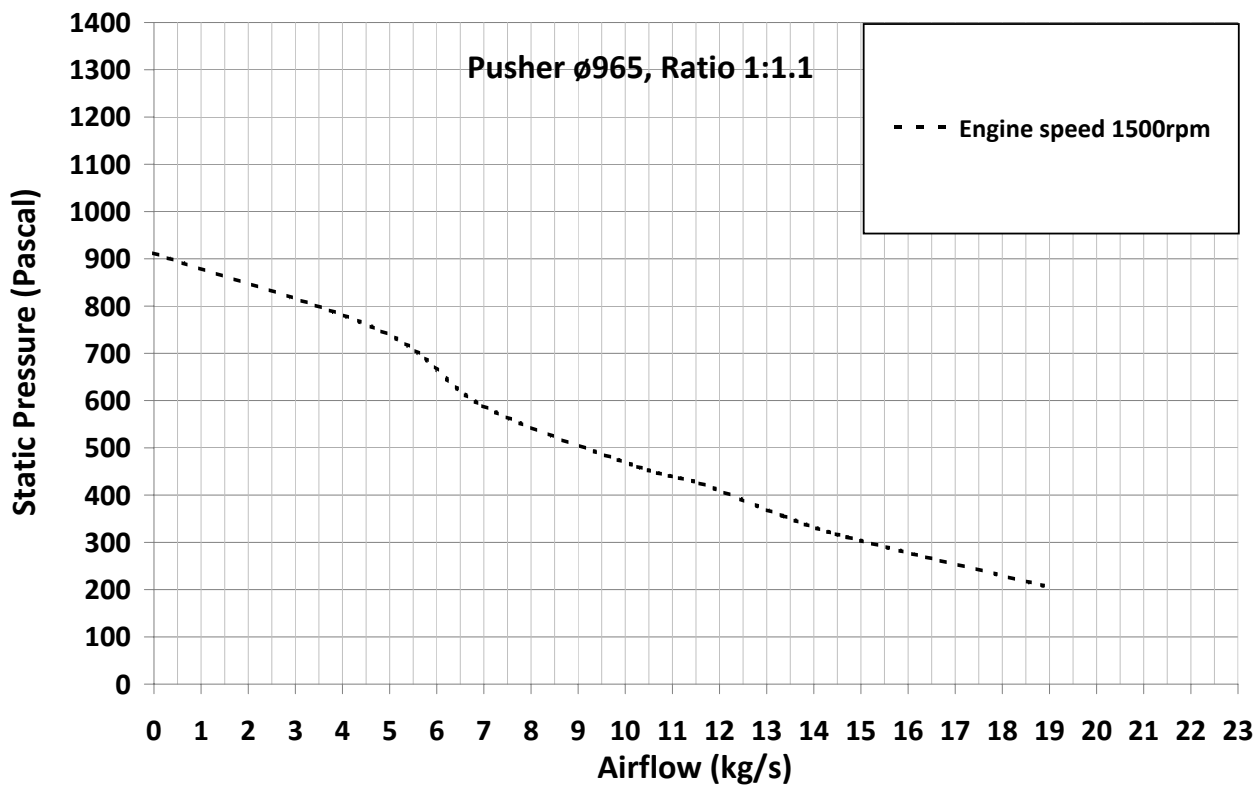
DI16, Auxiliary engines only

NOTE! Only engine speed 1500 rpm is allowed.



FOR SALES INFORMATION ONLY

Engine speed (rpm)	1500
Fan power (kW)	24





78 SEA WATER PUMP

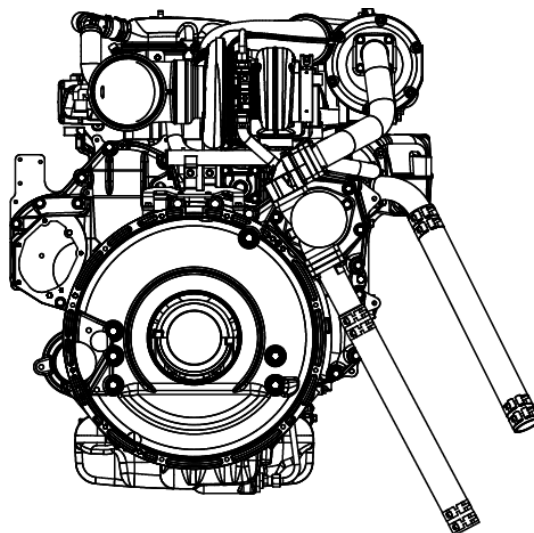
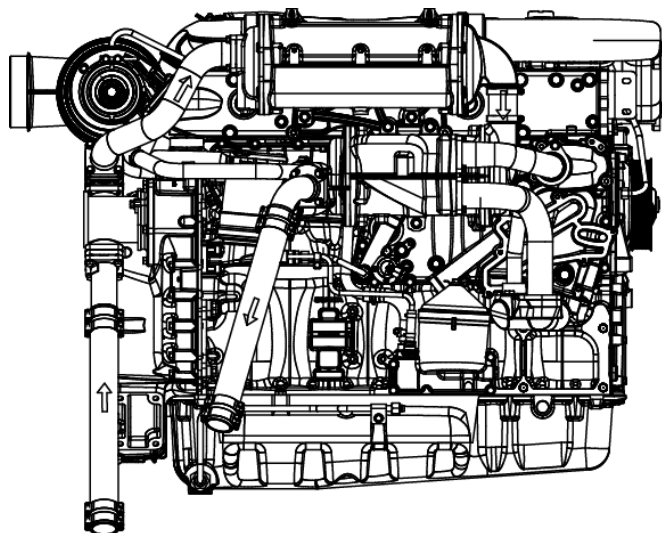
9-series

-02 O With connection hoses

Drawing: 2 127 357

DI9

Only for engines with heat exchanger



2:5673

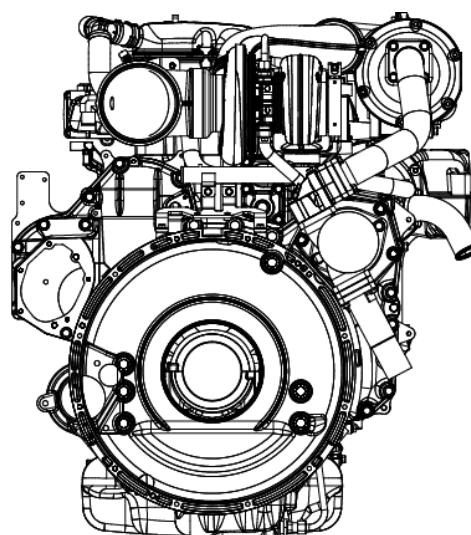
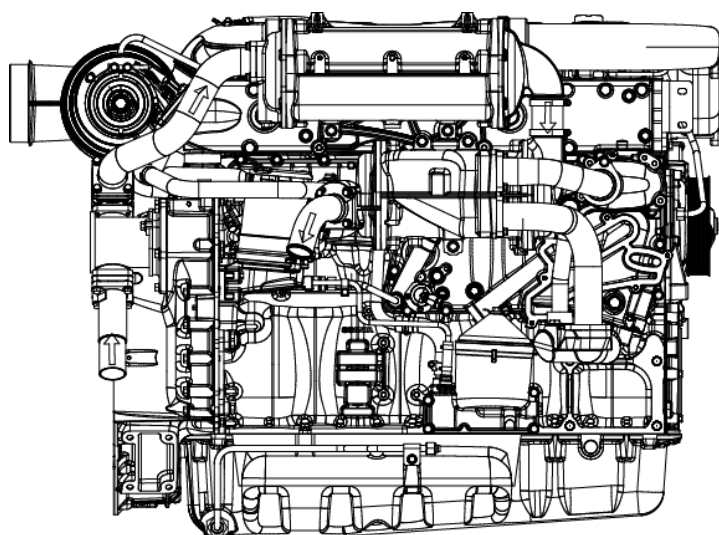
FOR SALES INFORMATION ONLY

-03 O With connection tubes

Drawing: 2 127 357

DI9

Only for engines with heat exchanger



2:5674

FOR SALES INFORMATION ONLY



78 SEA WATER PUMP

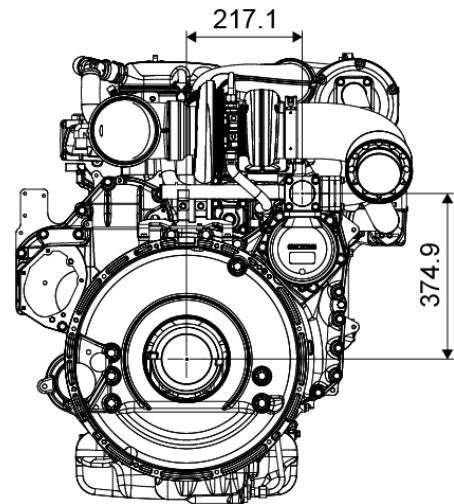
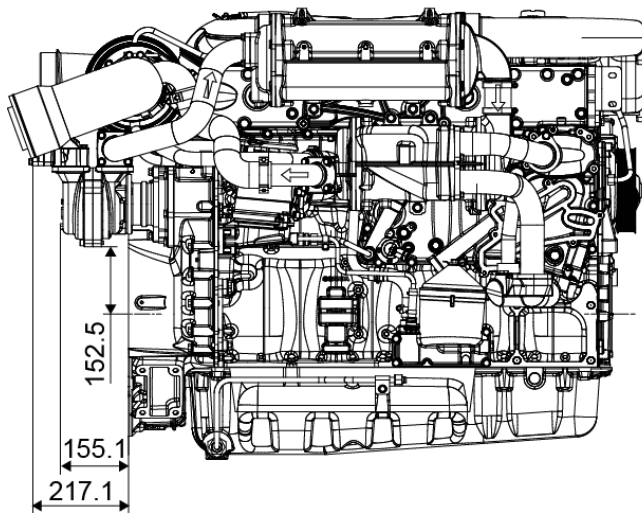
9-series

-11 O Self-priming centrifugal pump

Drawing: 2 127 357

D19

Only for engines with heat exchanger



2:5672

FOR SALES INFORMATION ONLY



78 SEA WATER PUMP

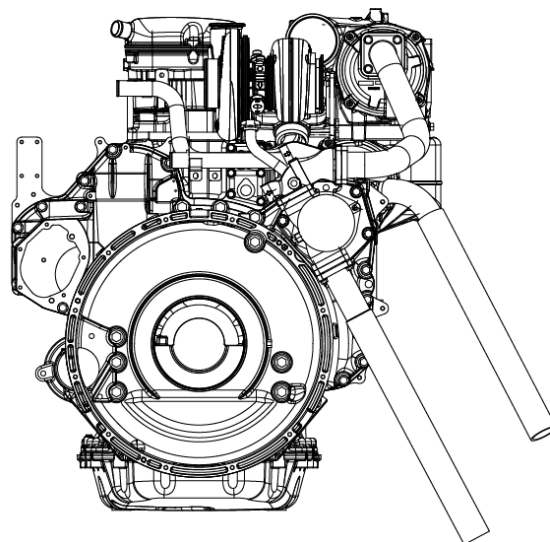
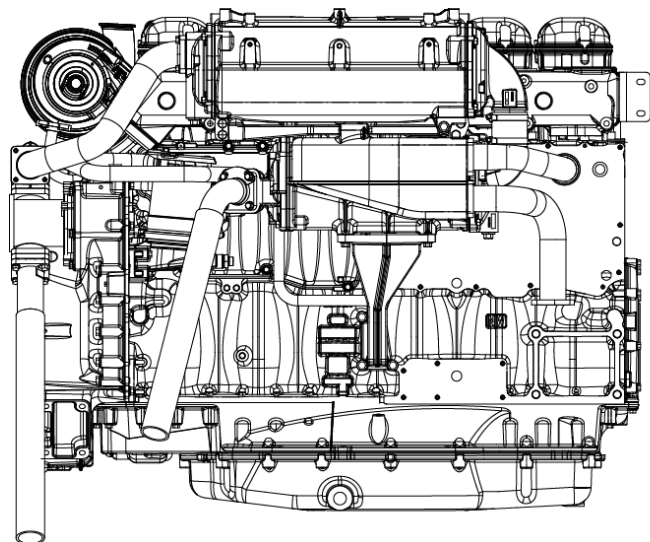
13-series

-02 O With connection hoses

Drawing: 1 866 201

DI13

Only for engines with heat exchanger



2:5660

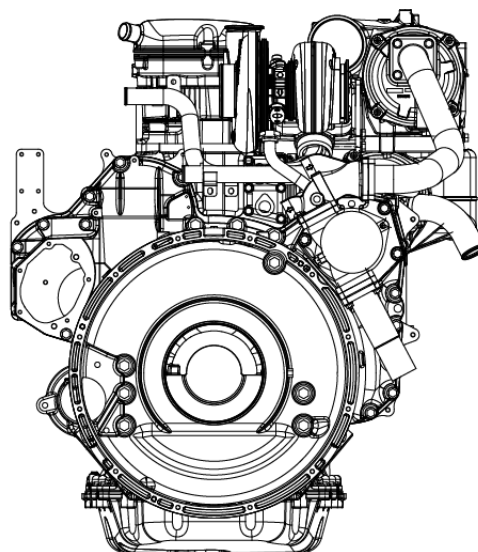
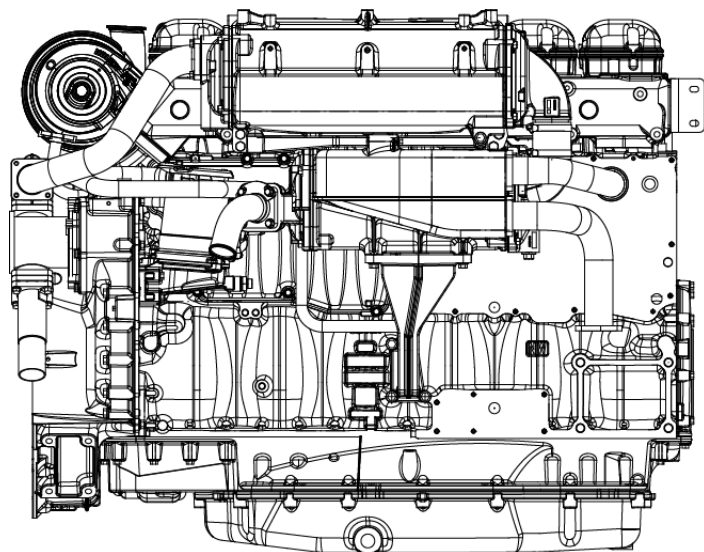
FOR SALES INFORMATION ONLY

-03 O With connection tubes

Drawing: 1 866 201

DI13

Only for engines with heat exchanger



2:5663

FOR SALES INFORMATION ONLY



78 SEA WATER PUMP

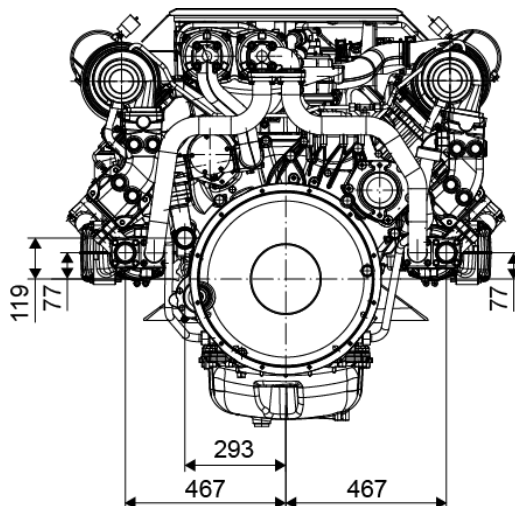
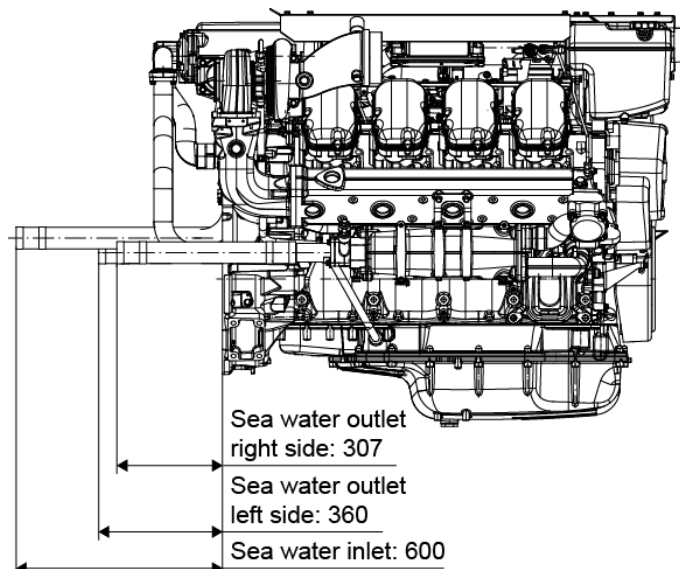
16-series

-02 O With connection hoses

Drawing: 2 254 367

D116

Only for engines with heat exchanger



2:5691

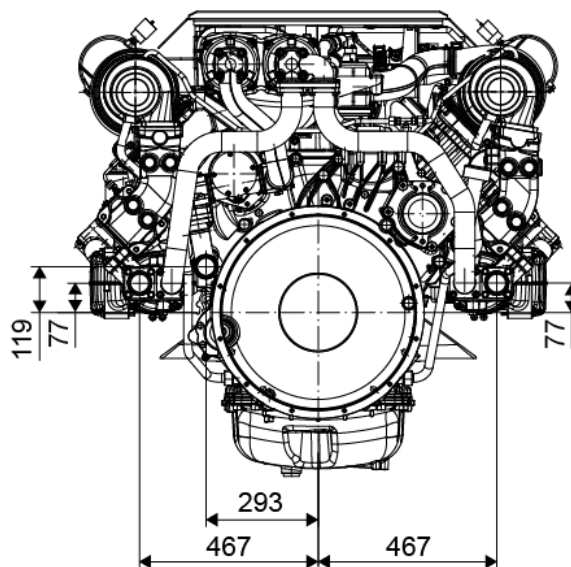
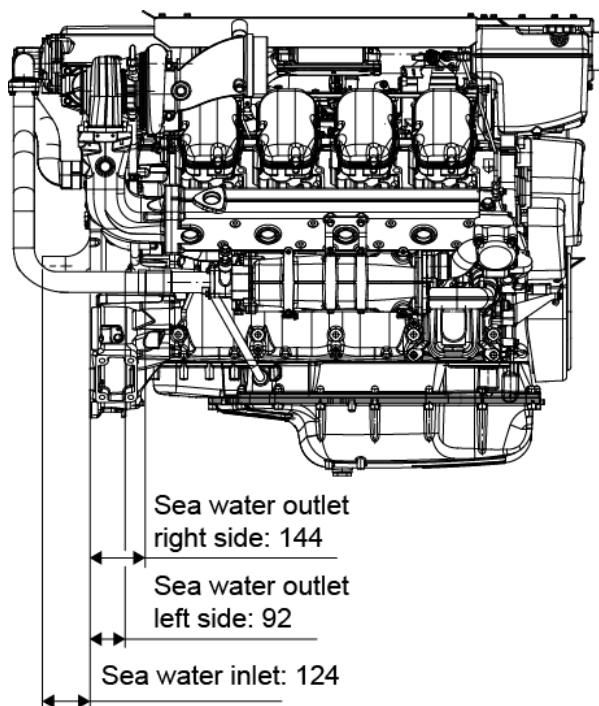
FOR SALES INFORMATION ONLY

-03 O With connection tubes

Drawing: 2 254 367

D116

Only for engines with heat exchanger



2:5692

FOR SALES INFORMATION ONLY

7_B



78A BILGE PUMP

9-series, 13-series

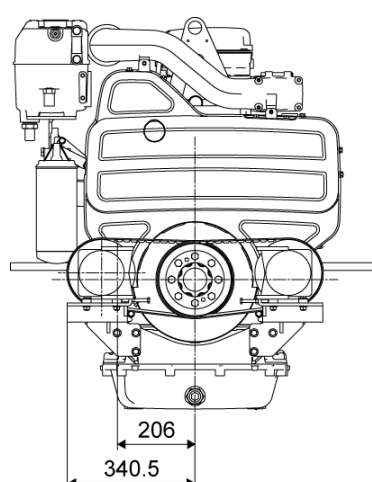
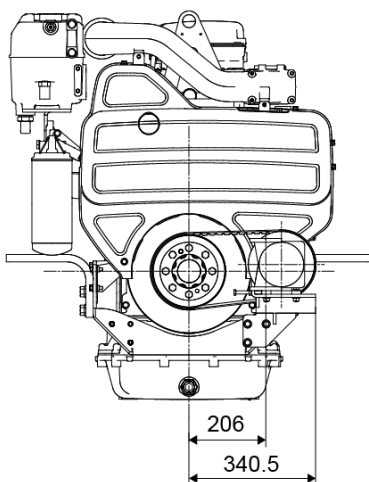
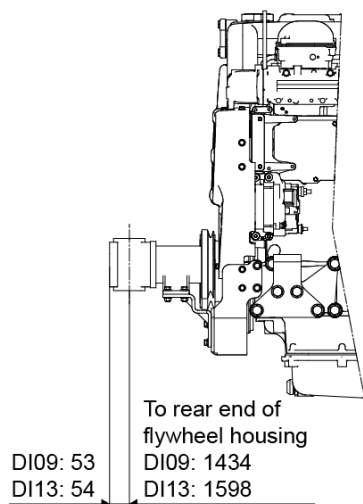
- 01 O With one bilge pump
- 02 O With two bilge pumps

Drawing: 1 866 350
Drawing: 1 866 350

DI9, DI13
DI9, DI13

WITH ONE PUMP

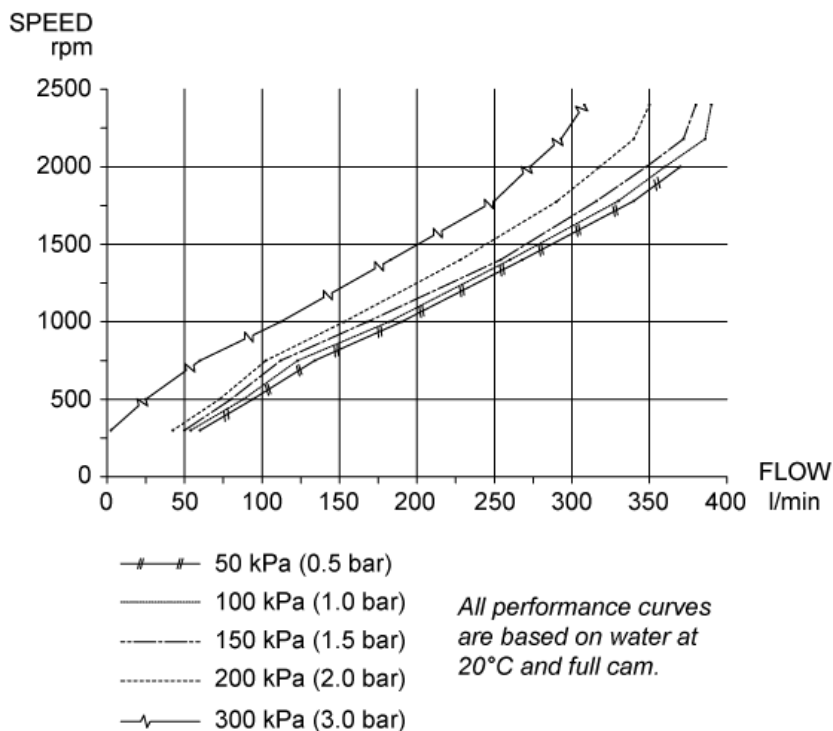
WITH TWO PUMPS



17:5034

17:5035

FOR SALES INFORMATION ONLY



17:5036



78A BILGE PUMP

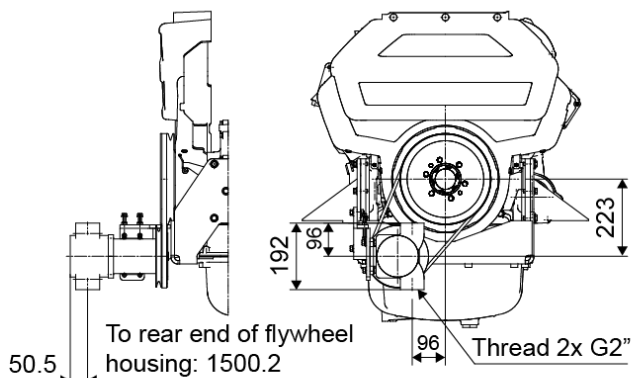
16-series

-01 O With 2" connection

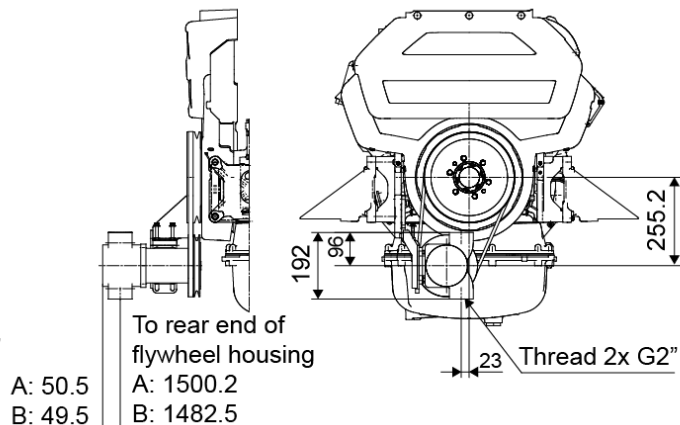
Drawing: 2 108 801

D116

With engine brackets
Fixed low (49-01/01Z/02)

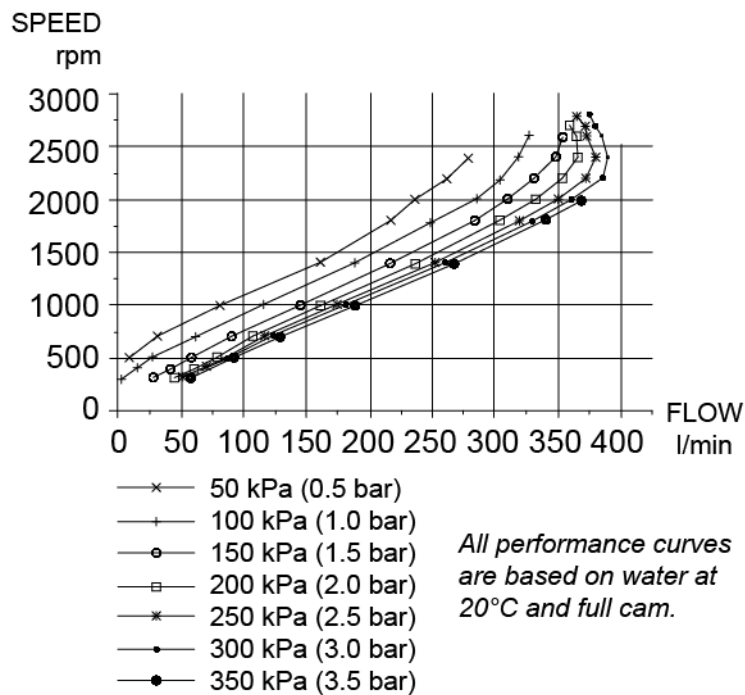


With engine brackets
A: Fixed extra low (49-09/09Z/10) and
B: For repowering (49-11/11Z/12)



17:5039

FOR SALES INFORMATION ONLY



17:5040

7_B



78B SEA WATER PUMP POSITION

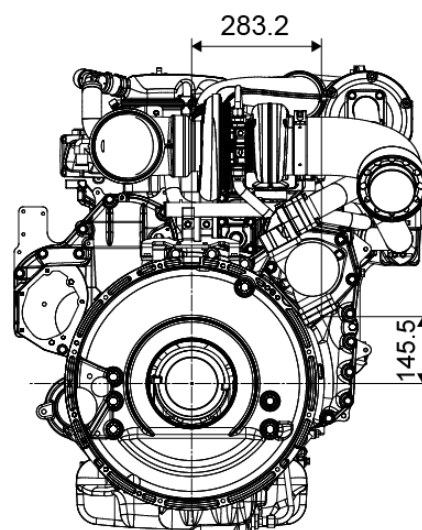
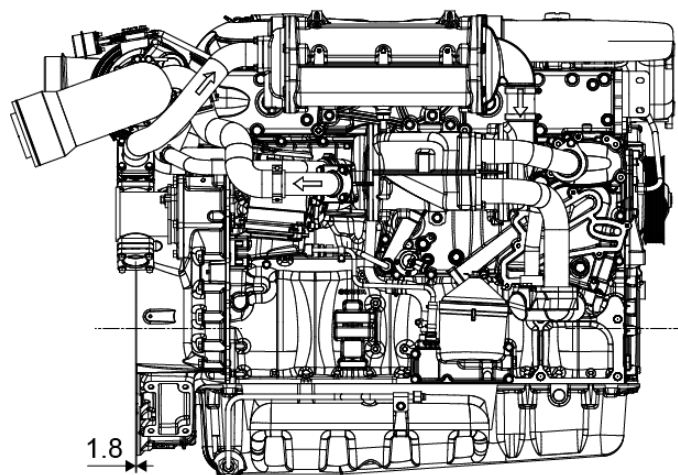
9-series

-01 S SAE B high rear

Drawing: 2 127 357

All-speed engines only

Only for engines with heat exchanger



FOR SALES INFORMATION ONLY

-01AS SAE B high rear

Drawing: 2 127 357

Auxiliary engines only

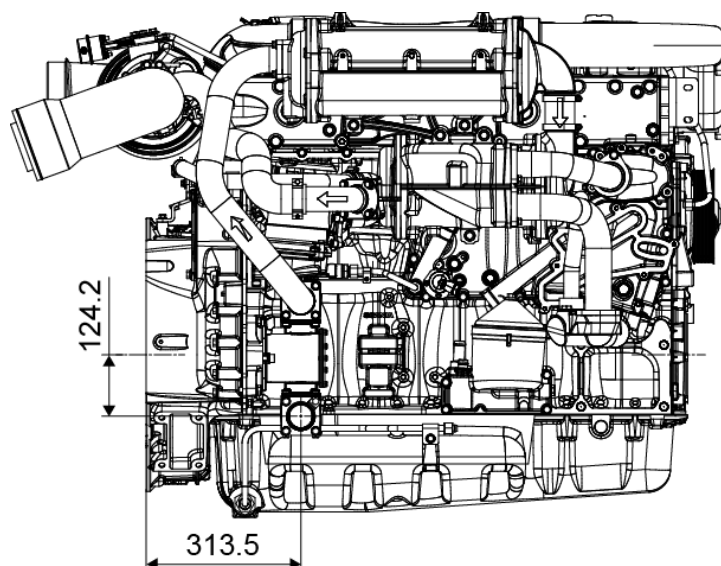
Only for engines with heat exchanger

-02 O SAE B high rear

Drawing: 2 127 357

All-speed engines only

Only for engines with heat exchanger



FOR SALES
INFORMATION ONLY



78B SEA WATER PUMP POSITION

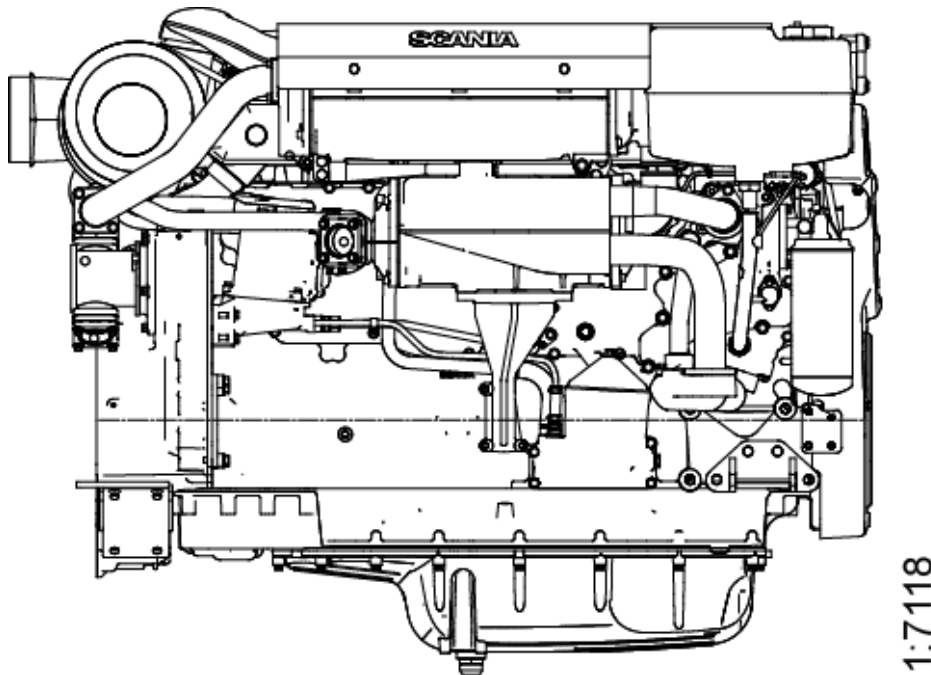
13-series

-01 S SAE B high rear

Drawing: 1 866 386

All-speed engines only

Only for engines with heat exchanger



1:7118

FOR SALES
INFORMATION ONLY

-01AS SAE B low rear pointing forward

Drawing: 1 866 201

Auxiliary engines only

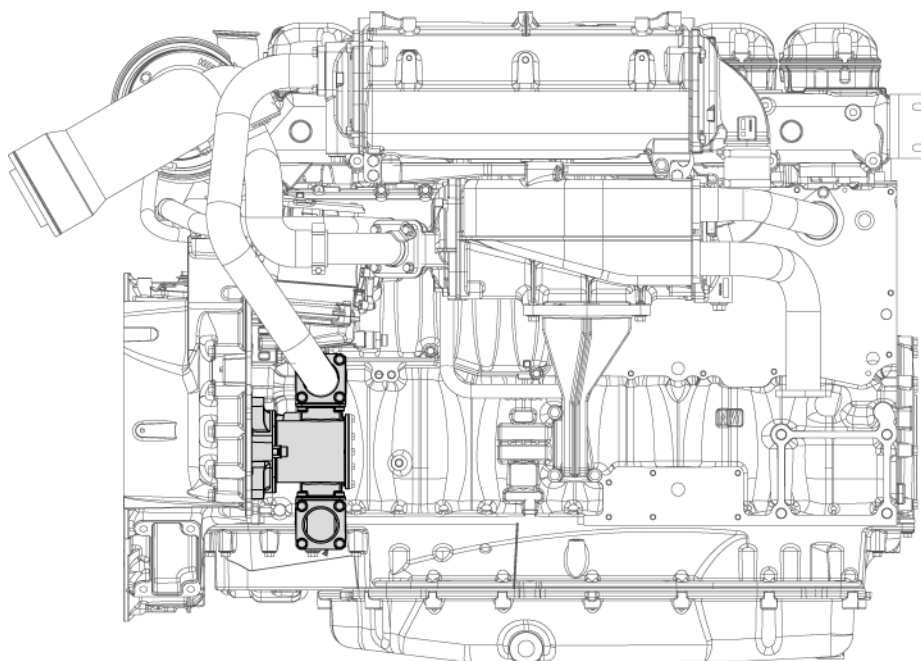
Only for engines with heat exchanger

-02 O SAE B low rear pointing forward

Drawing: 1 866 201

All-speed engines only

Only for engines with heat exchanger



2:5658

FOR SALES
INFORMATION ONLY

7_B

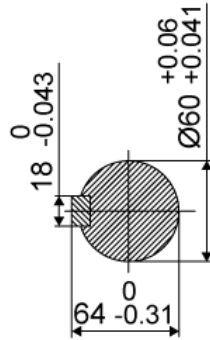
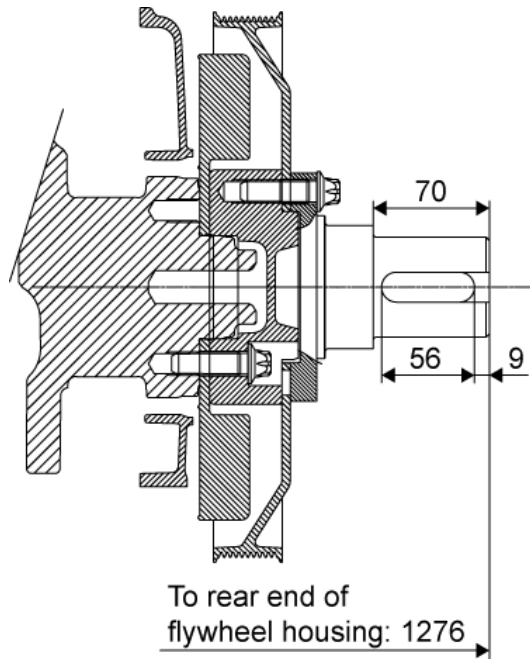


90 FRONT-MOUNTED POWER TAKE-OFF (PTO)

9-series

-01 O Stub shaft for connection of flexible coupling. Max torque 800 Nm.

DI9



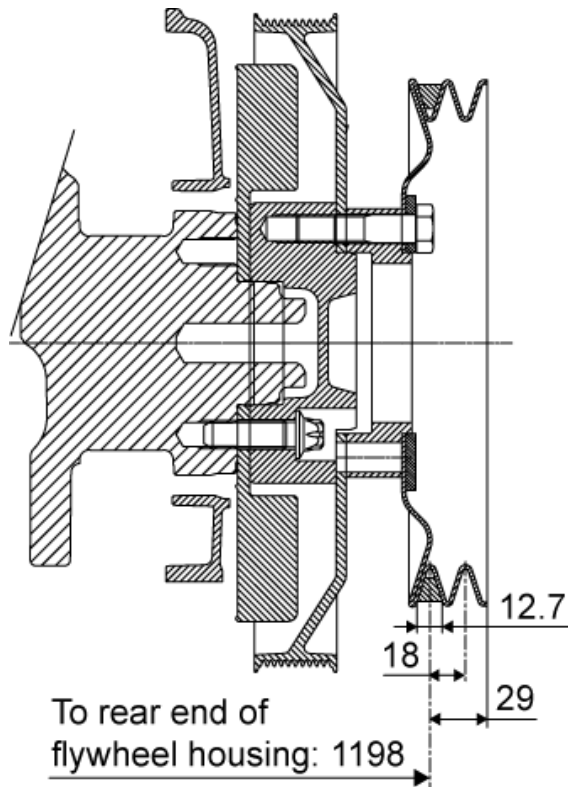
FOR SALES
INFORMATION ONLY

1:7034

-02 O Crankshaft pulley with two extra grooves, Ø260 mm

Drawing: 1 883 974

DI9



FOR SALES
INFORMATION ONLY

1:7035

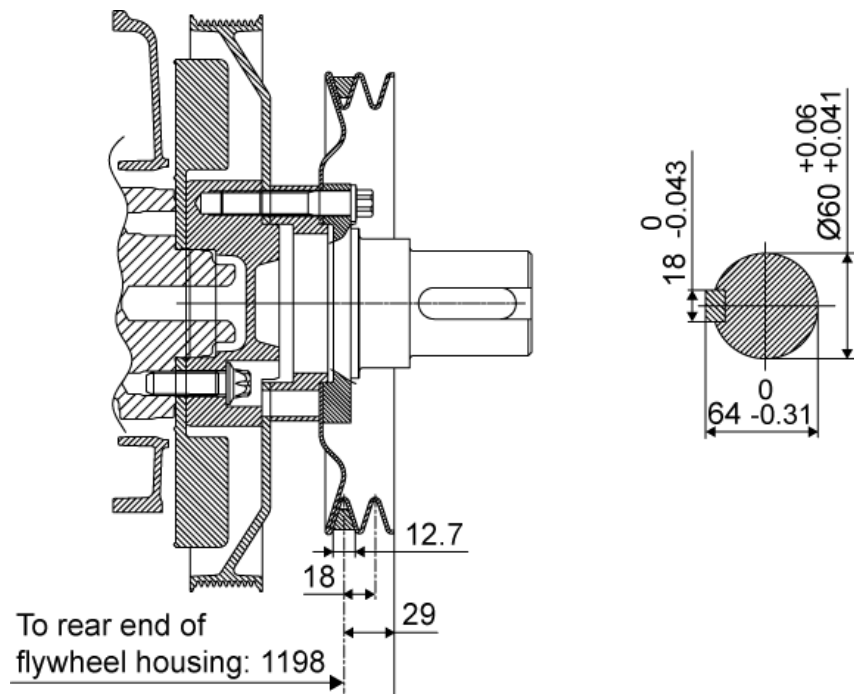


90 FRONT-MOUNTED POWER TAKE-OFF (PTO)

9-series

- 03 O Stub shaft for connection of flexible coupling with crankshaft pulley with two extra grooves, Ø260 mm

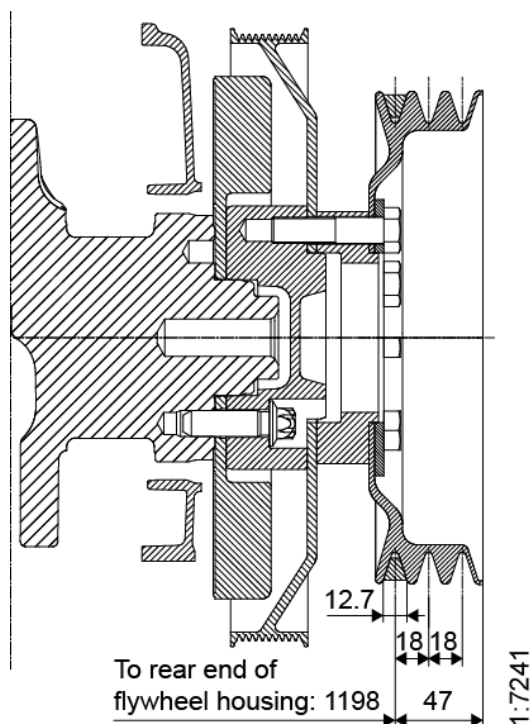
D19



- 04 O Crankshaft pulley with three extra grooves, Ø260 mm

Drawing: 1 883 974

D19



7_B

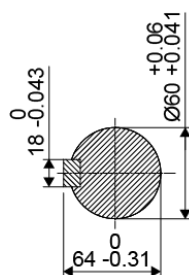
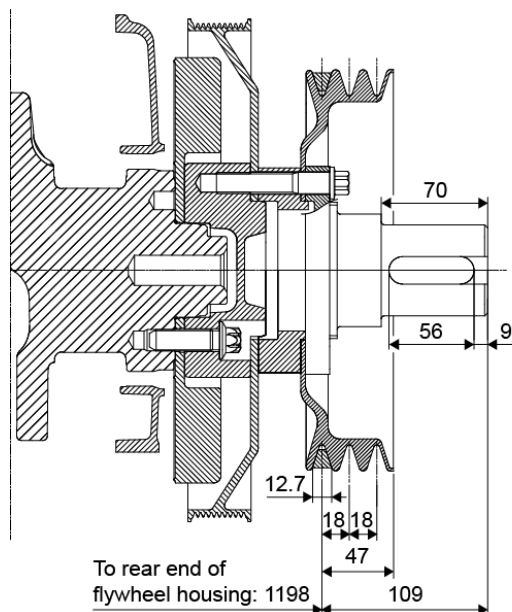


90 FRONT-MOUNTED POWER TAKE-OFF (PTO)

9-series

- 07 O Stub shaft for connection of flexible coupling with crankshaft pulley with three extra grooves, Ø260 mm

DI9



1:7242

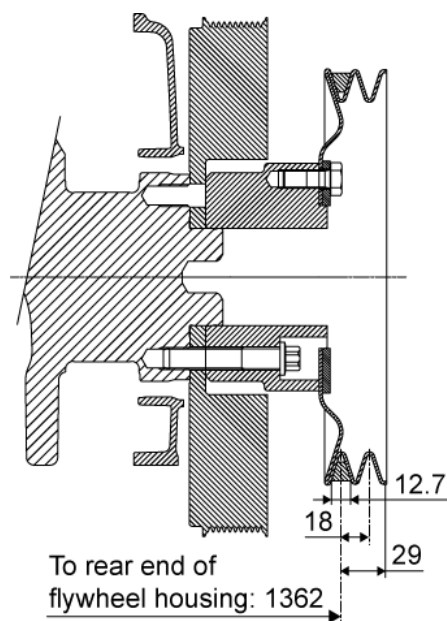
FOR SALES
INFORMATION ONLY

90 FRONT-MOUNTED POWER TAKE-OFF (PTO)

13-series

- 02 O Crankshaft pulley with two extra grooves, Ø260 mm

DI13



1:7038

FOR SALES
INFORMATION ONLY

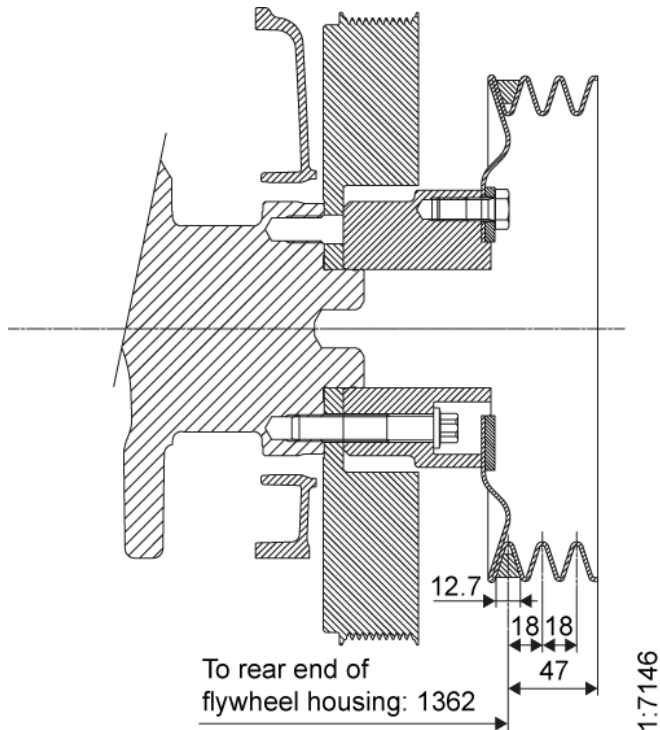


90 FRONT-MOUNTED POWER TAKE-OFF (PTO)

13-series

-04 O Crankshaft pulley with three extra grooves, Ø260 mm Drawing: 1 866 359

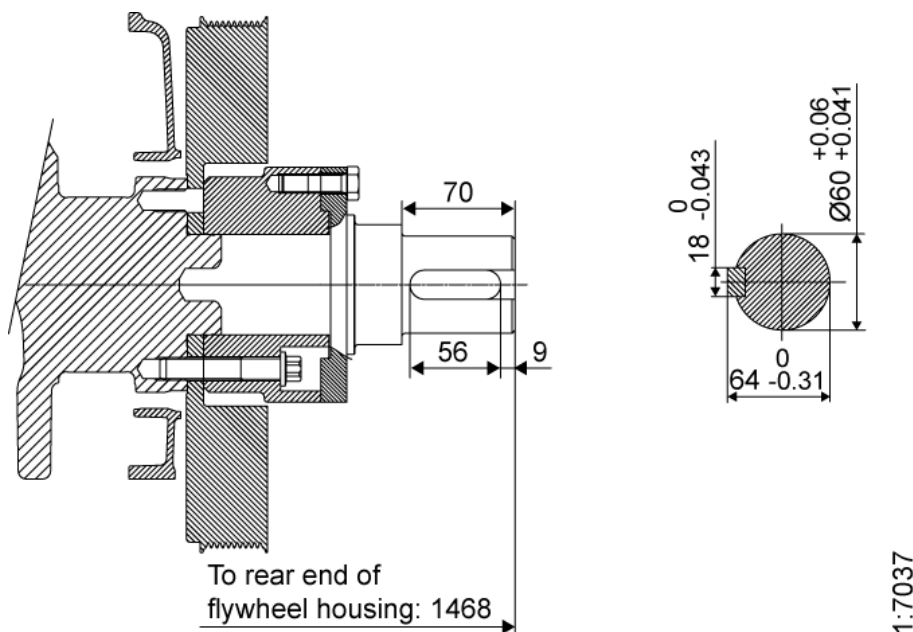
D113



FOR SALES
INFORMATION ONLY

-05 O Stub shaft for connection of flexible coupling. Max torque 1200 Nm. Drawing: 1 866 359

D113



FOR SALES
INFORMATION ONLY

7_B

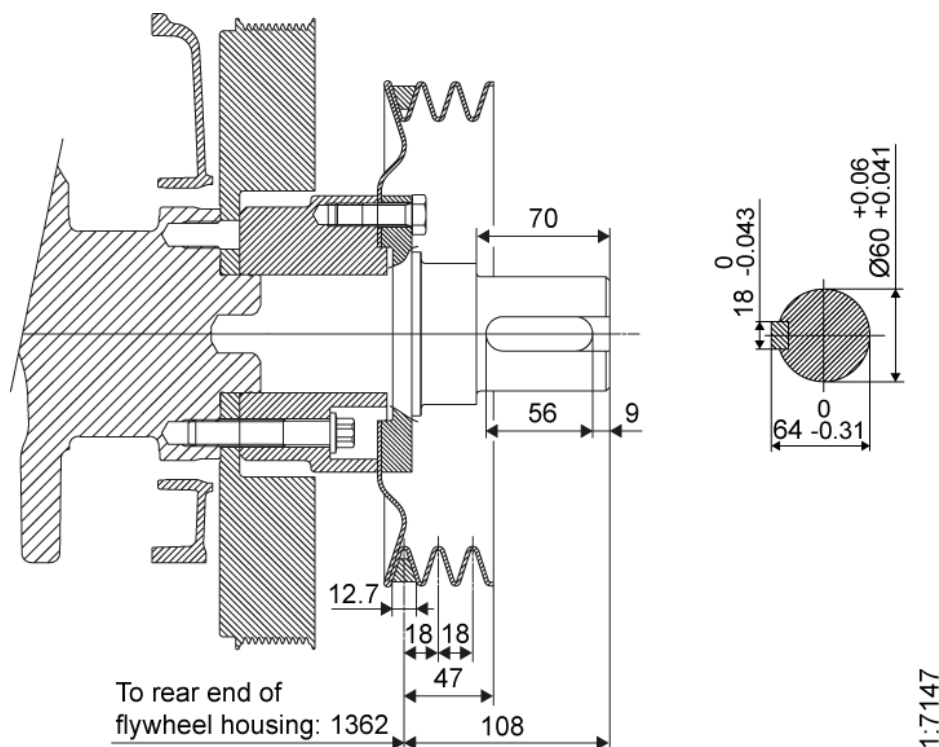


90 FRONT-MOUNTED POWER TAKE-OFF (PTO)

13-series

- 06 O Stub shaft for connection of flexible
coupling with crankshaft pulley
with three extra grooves, Ø260 mm.
Max torque 1200 M.

DI13



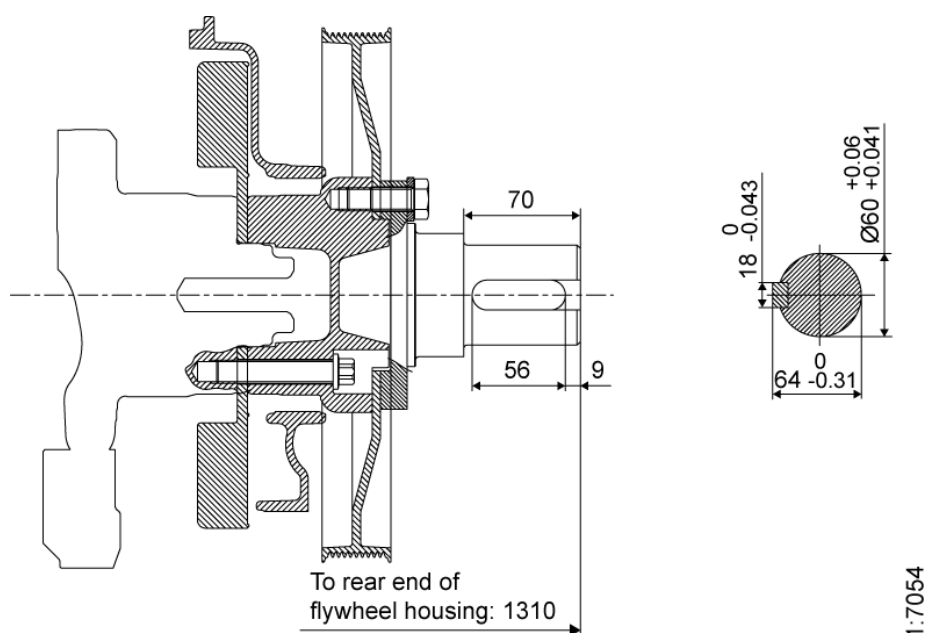
FOR SALES
INFORMATION ONLY

90 FRONT-MOUNTED POWER TAKE-OFF (PTO)

16-series

- 01 O Stub shaft for connection of flexible
coupling

DI16



FOR SALES
INFORMATION ONLY



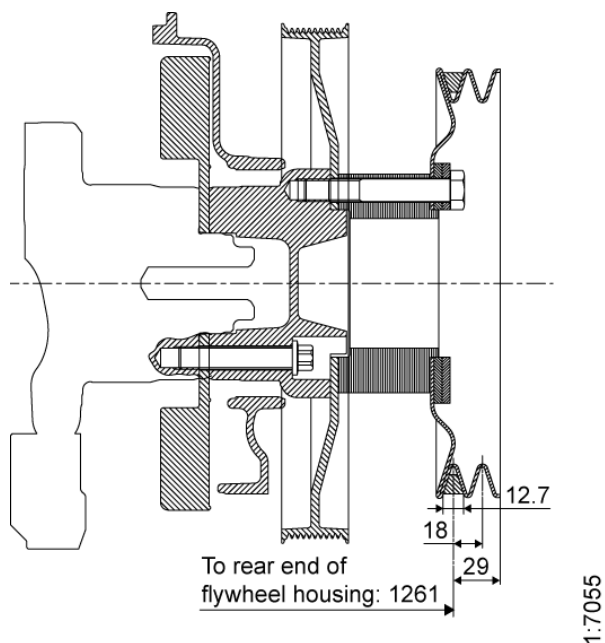
90 FRONT-MOUNTED POWER TAKE-OFF (PTO)

16-series

-02 O Crankshaft pulley with two extra grooves, Ø260 mm

Drawing: 1 883 995

D116

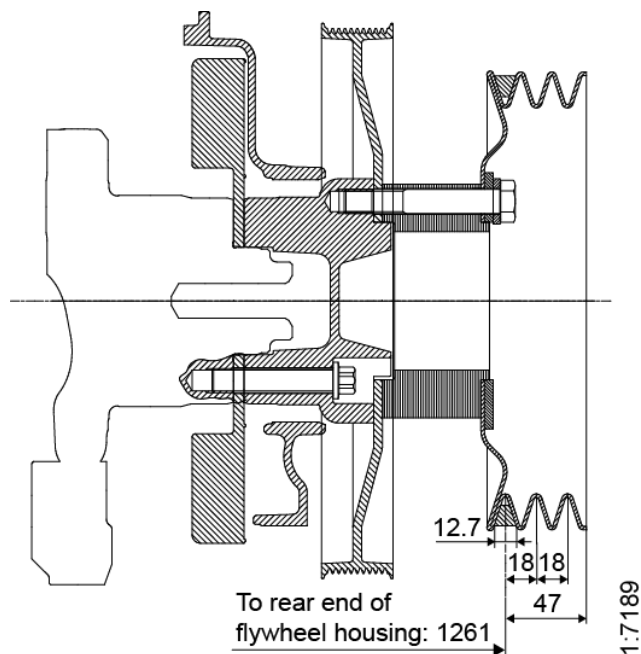


FOR SALES
INFORMATION ONLY

-04 O Crankshaft pulley with three extra grooves, Ø260 mm

Drawing: 1 883 995

D116



FOR SALES
INFORMATION ONLY

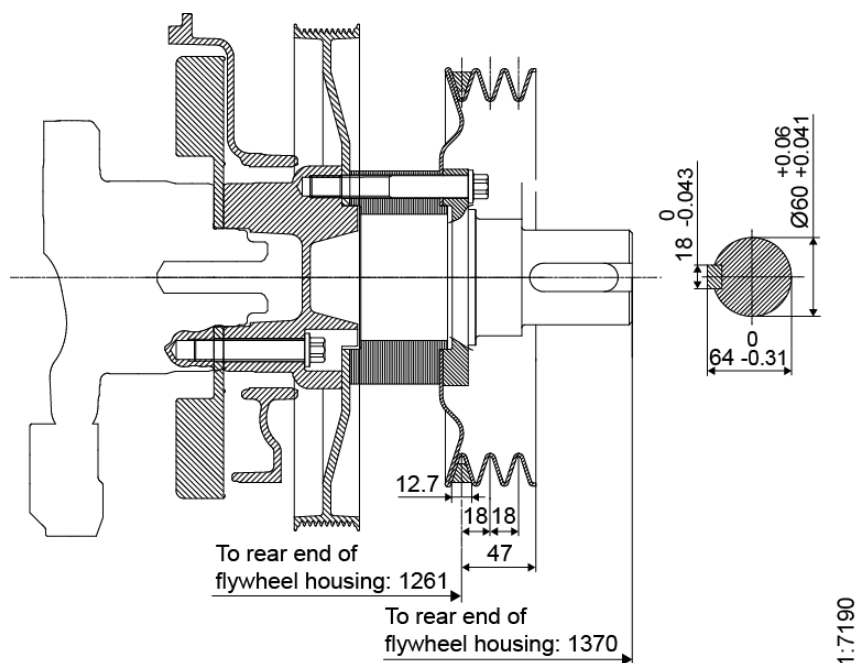
7_B

90 FRONT-MOUNTED POWER TAKE-OFF (PTO)

16-series

-05 O Stub shaft for connection of flexible coupling with crankshaft pulley with three extra grooves, Ø260 mm

DI16



FOR SALES
INFORMATION ONLY

1:7190



91 SIDE-MOUNTED POWER TAKE-OFF (PTO)

9-series, 13-series

-02 O SAE B, 2-hole, 13 teeth. Gear ratio Drawing: 1 448 964

D19, D113

1:1.19. Pointing backwards.

Connection flange:

SAE B 2-hole (J744)

Shaft:

SAE B (J744)

13 teeth, 0.8125" pitch Ø

6/32" Ø module pitch

Gear ratio:

1:1.19

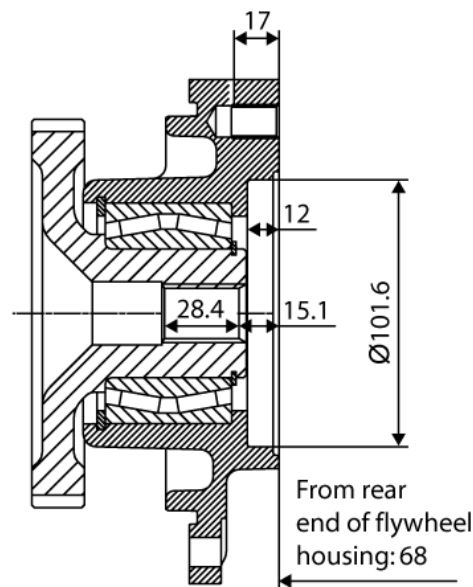
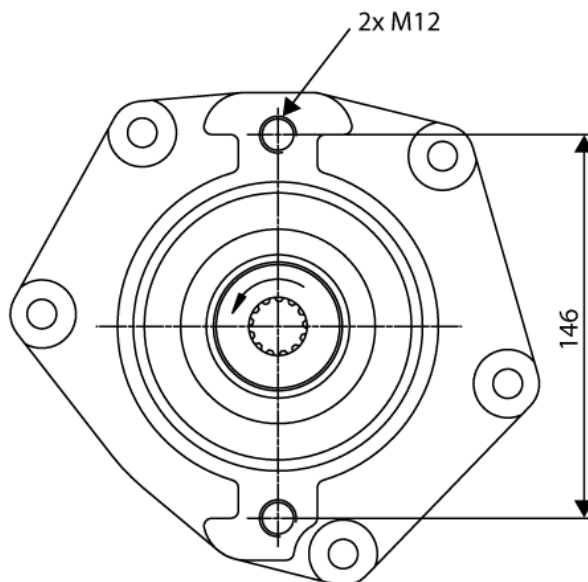
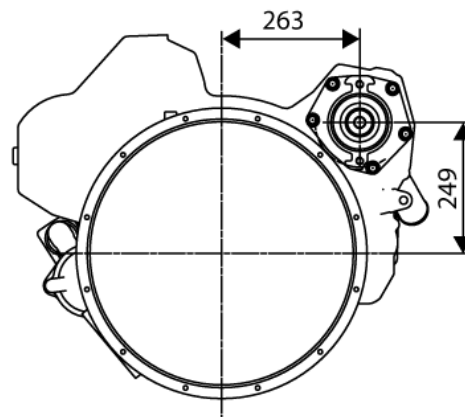
Direction of rotation:

Counter clockwise

(seen from flywheel end of engine)

Maximum torque:

250 Nm (400 Nm Intermittent operation)



FOR SALES INFORMATION ONLY

1-6962

7_B



91 SIDE-MOUNTED POWER TAKE-OFF (PTO)

9-series, 13-series

-03 O SAE A, 2-hole, 9 teeth. Gear ratio Drawing: 1 798 247

DI9, DI13

1:1.71. Pointing backwards.

Connection flange:

SAE A 2-hole (J744)

Shaft:

SAE A (J744)

9 teeth, 1.5875" pitch Ø

6/32" Ø module pitch

Gear ratio:

1:1.71

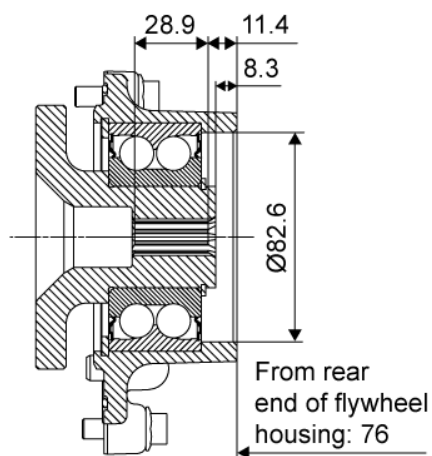
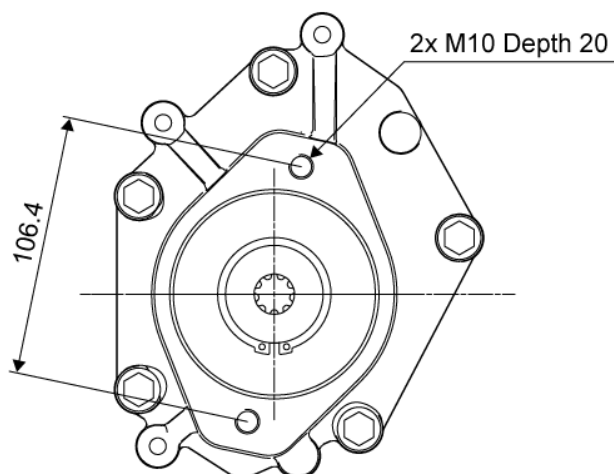
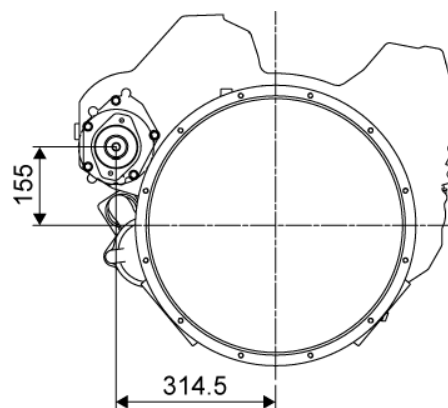
Direction of rotation:

Counter clockwise

(seen from flywheel end of engine)

Maximum torque:

100 Nm (125 Nm Intermittent operation)



1:7046

FOR SALES INFORMATION ONLY



91 SIDE-MOUNTED POWER TAKE-OFF (PTO)

9-series, 13-series

-05 O SAE B, 2-hole, 13 teeth. Gear ratio Drawing: 1 945 647

D19, D113

1:1.19. Low, pointing forward.

Connection flange:

SAE B 2-hole (J744)

Shaft:

SAE B (J744)

13 teeth, 16/32 DP

Gear ratio:

1:1.19

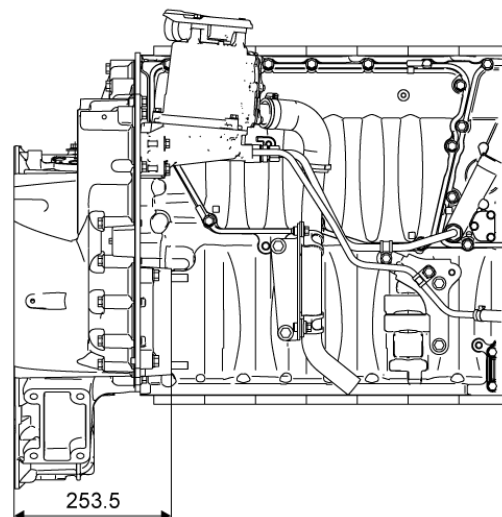
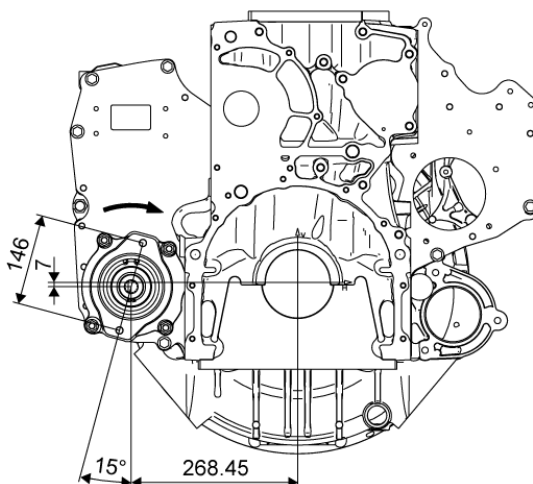
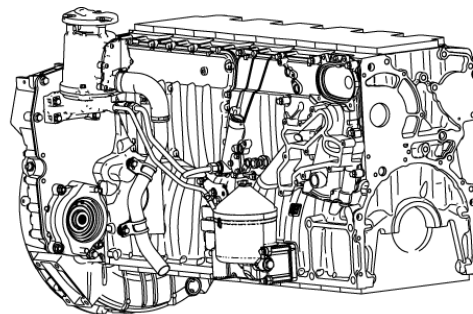
Direction of rotation:

Counter clockwise

(seen from flywheel end of engine)

Maximum torque:

200 Nm



1:7068

FOR SALES INFORMATION ONLY

7_B



91 SIDE-MOUNTED POWER TAKE-OFF (PTO)

16-series

-02 O SAE B, 2-hole, 13 teeth. Gear ratio Drawing: 1 507 581

DI16

1:1.19. Pointing backwards.

Connection flange:

SAE B 2-hole (J744)

Shaft:

SAE B (J744)

13 teeth, 0.8125" pitch Ø

6/32" Ø module pitch

Gear ratio:

1:1.19

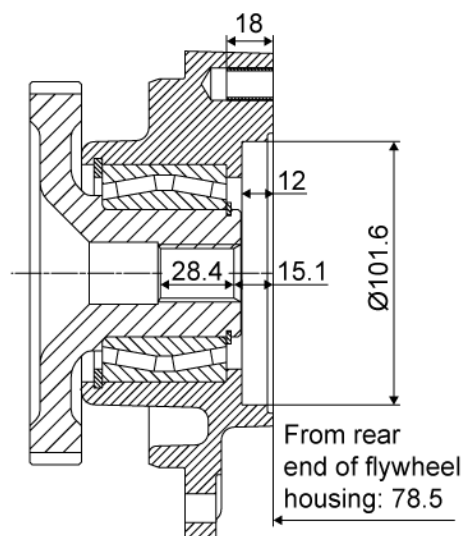
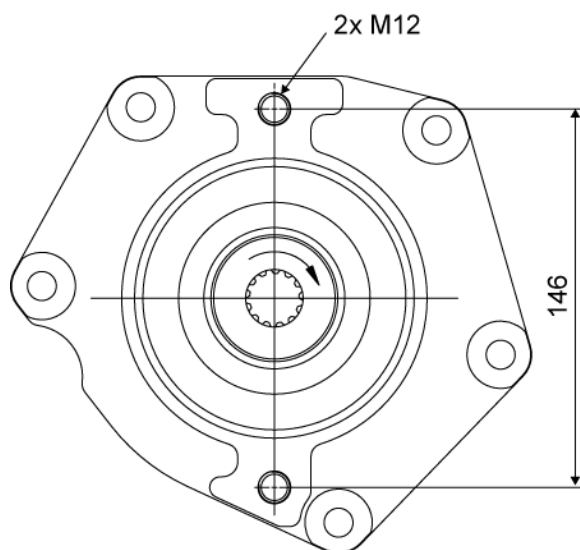
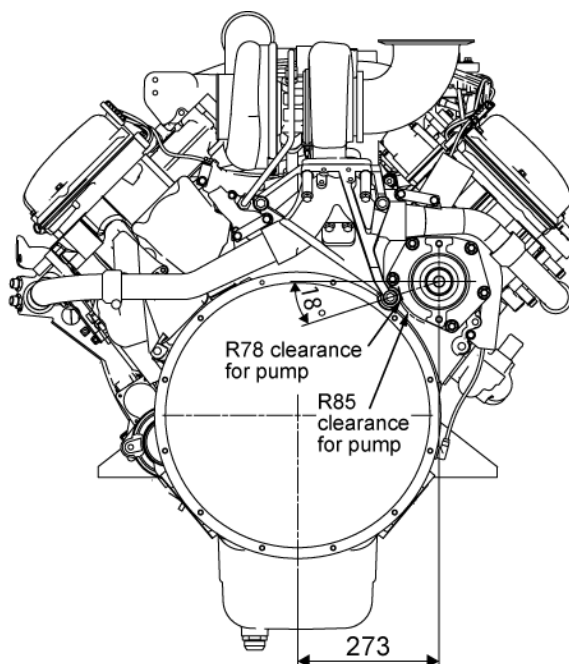
Direction of rotation:

Clockwise

(seen from flywheel end of engine)

Maximum torque:

400 Nm



1:6963

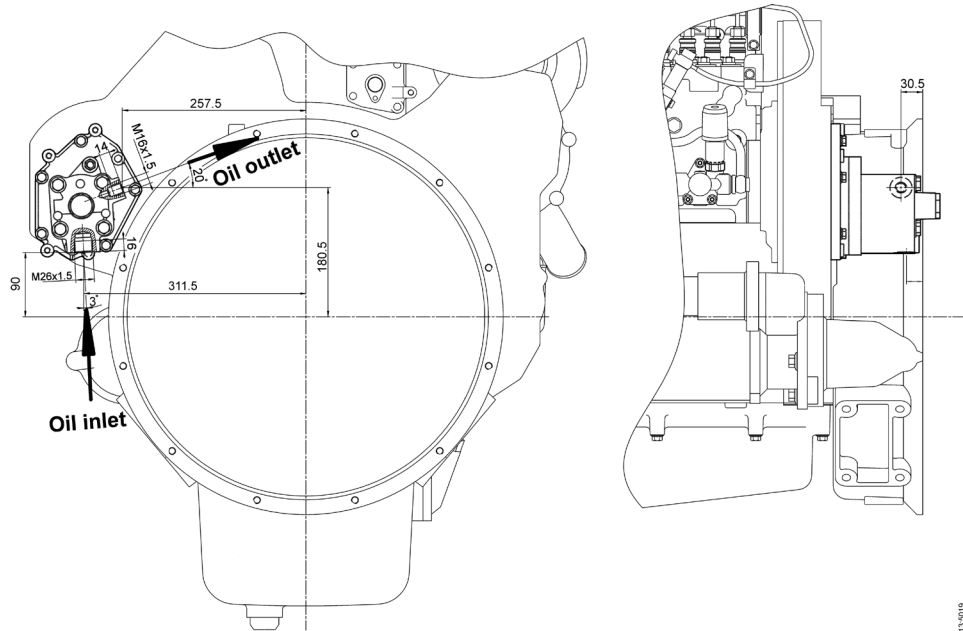
FOR SALES INFORMATION ONLY



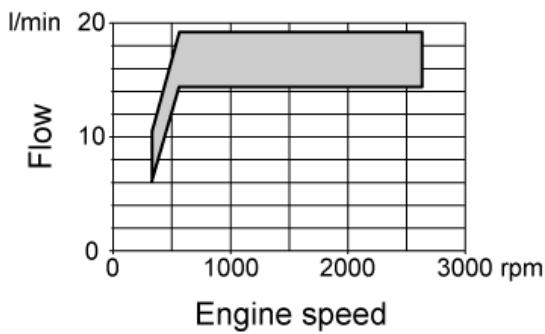
93 HYDRAULIC PUMP

9-series, 13-series

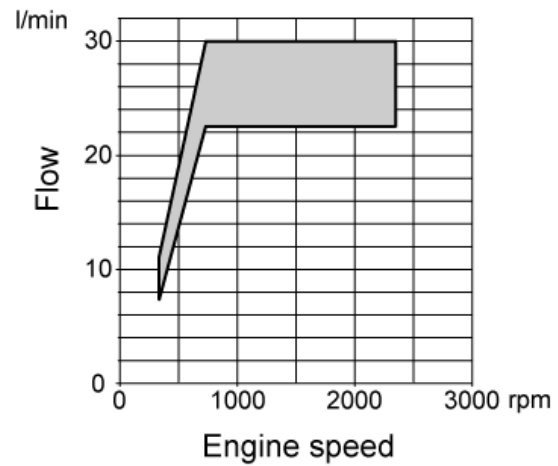
- | | | | |
|-----|--|--|-----------|
| -01 | O Capacity 16 l/min at 170 bar
intermittent, 25-30 bar continuous | Drawing: 1 757 131
Drawing: 1 449 167 | DI9, DI13 |
| -02 | O Capacity 25 l/min at 170 bar
intermittent, 25-30 bar continuous | Drawing: 1 757 131
Drawing: 1 449 167 | DI9, DI13 |



16 l/min



25 l/min



FOR SALES INFORMATION ONLY



93 HYDRAULIC PUMP

16-series

-01 O Capacity 16 l/min at 170 bar
intermittent, 25-30 bar continuous

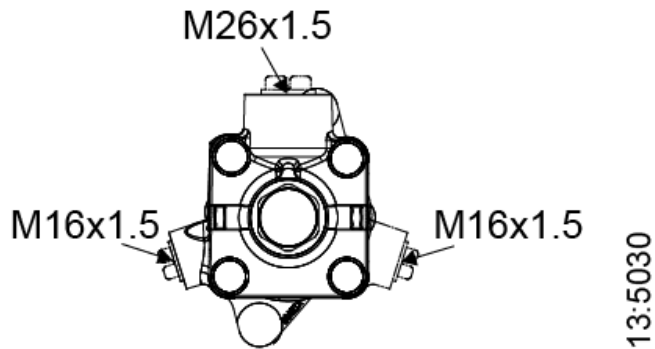
Drawing: 1 457 713

DI16

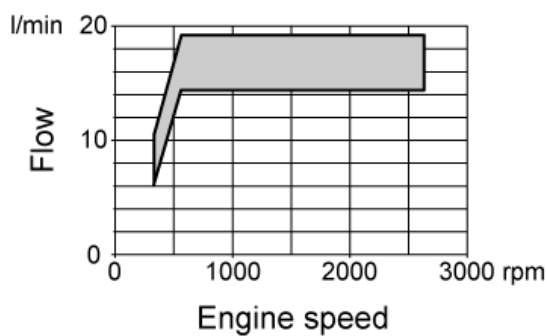
-02 O Capacity 25 l/min at 170 bar
intermittent, 25-30 bar continuous

Drawing: 1 457 713

DI16

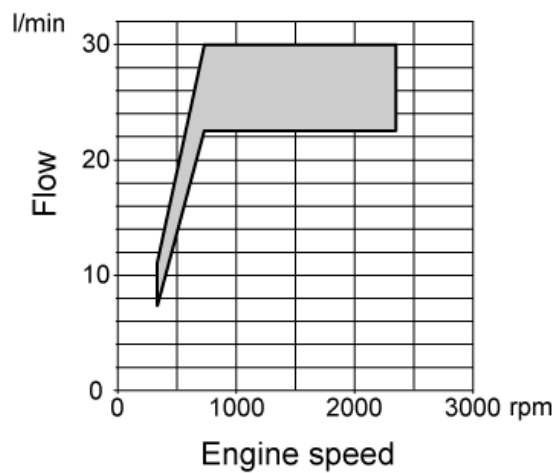


16 l/min



13:5028

25 l/min



13:5029

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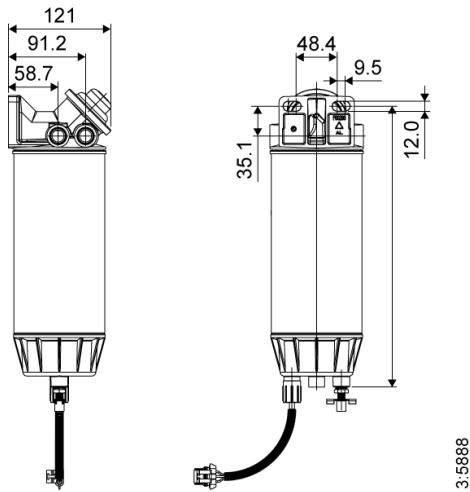
98C FUEL PRE-FILTER

9-series, 13-series, 16-series

-01 S Single fuel filter with water separator

Drawing: 1 774 501

DI9, DI13, DI16

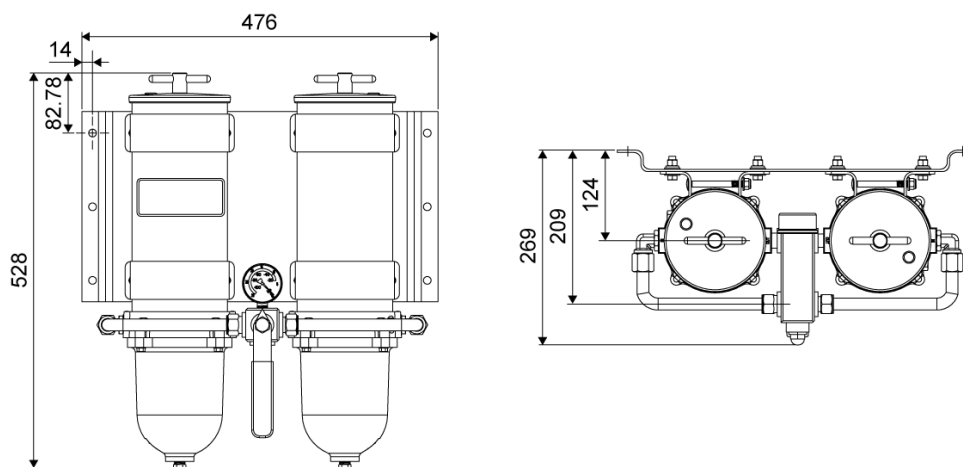


FOR SALES INFORMATION ONLY

-03 O Reversible dual fuel filter with water separator

Drawing: 1 769 500

DI9, DI13, DI16





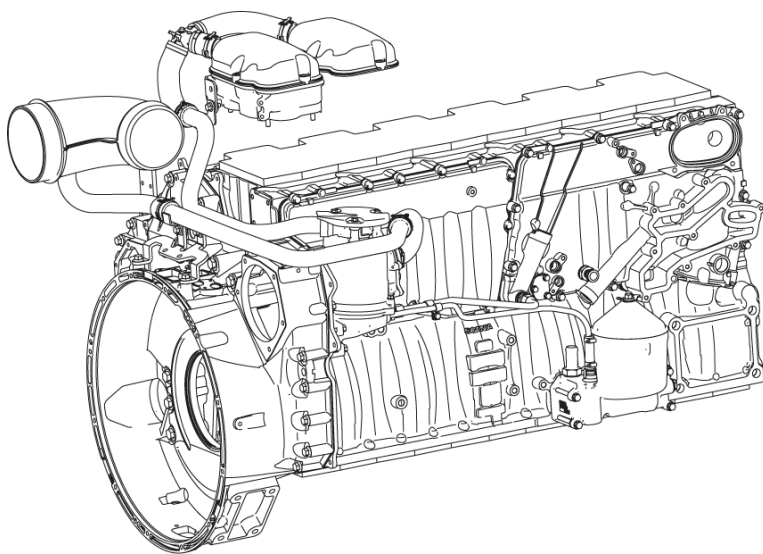
99L CRANKCASE VENTILATION

9-series, 13-series

-01 S Closed ventilation

Drawing: 1 866 026

DI9, DI13



3:5887

FOR SALES INFORMATION ONLY

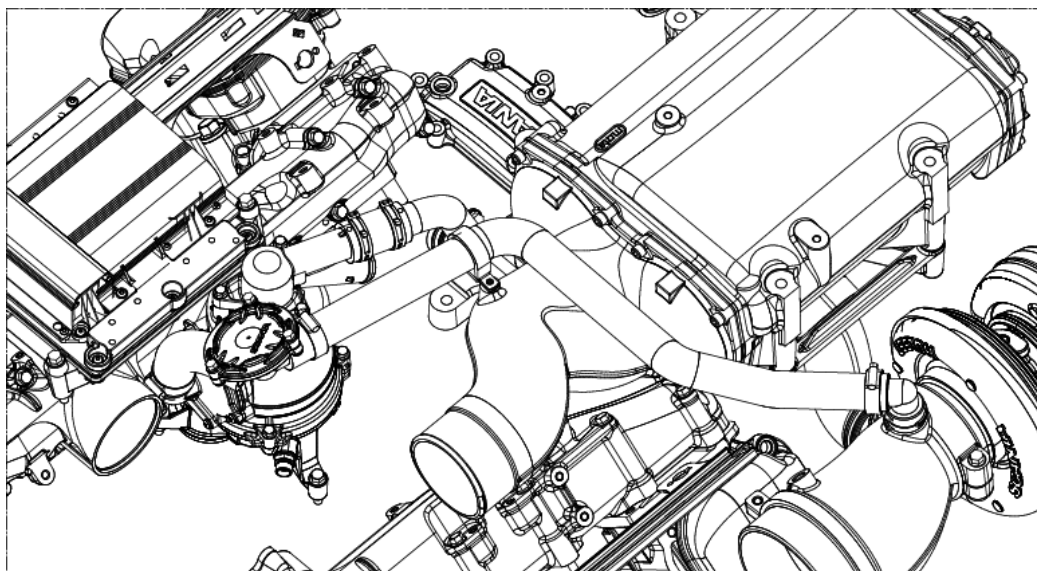
99L CRANKCASE VENTILATION

16-series

-01 S Closed ventilation

Drawing: 2 017 567

DI16



3:5890

FOR SALES INFORMATION ONLY



8 | MARINE TRANSMISSIONS

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Introduction

For marine applications Scania can offer packages including engine, transmission and all necessary suspension parts. The transmissions are designed and manufactured by Twin Disc and ZF; they are fitted with Scania designed suspensions in order to fit a variety of marine applications. The complete package including engine and transmission is assembled and painted by Scania.

This section contains recommendation lists for marine transmissions and dimensions for installation of an engine with a marine transmission as well as deep down description of available transmission models and equipment for the Scania marine engines. At the end of this section is an example of the information needed for ordering marine transmissions as well as information on how to order.

Scania recommends that the following applies for marine transmissions:

- The use of a flexible coupling between engine and transmission
- A TVC analysis of the installation shall be made
- The general use of 6 point suspension for gear ratios greater than 1:2
- The type of suspension suitable for installation is depending on the operating conditions, for further information about suspension please contact your Scania Engines region manager

The flywheel housing flange is according to SAE1.

All installations are designed with the suspension level as close to the crankshaft center as possible.

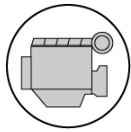
Note! Too many or too stiff suspension rubber pads (isolators) results in increase of transmittal of vibrations from the engine or transmission to the hull.

Note Torsional Vibration!

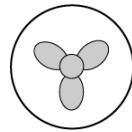
Disregarding propulsion system torsional compatibility could cause damage to components in the power train resulting in loss of mobility. At minimum system incompatibility could result in gear clatter at low speeds. The responsibility for ensuring that the torsional compatibility of the propulsion system is satisfactory rests with the assembler of the drive and driven equipment.



Sketches of transmissions

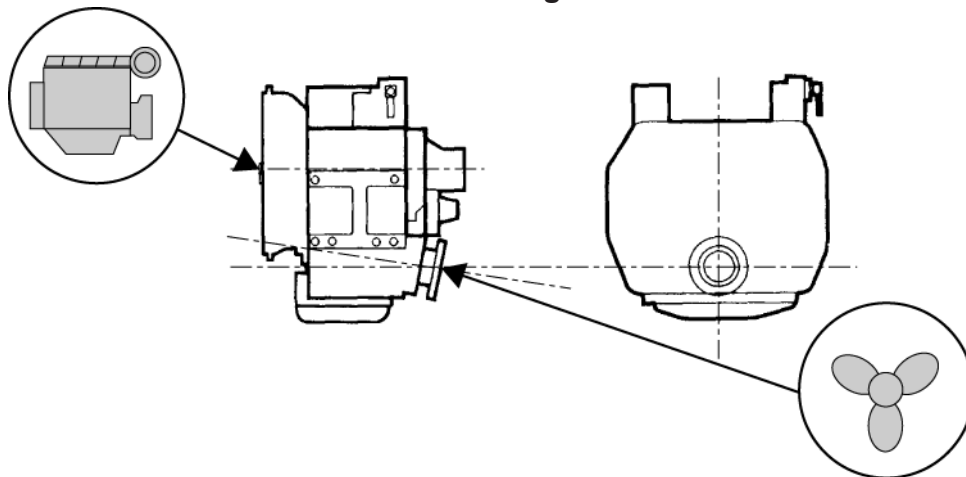


= Connection to engine

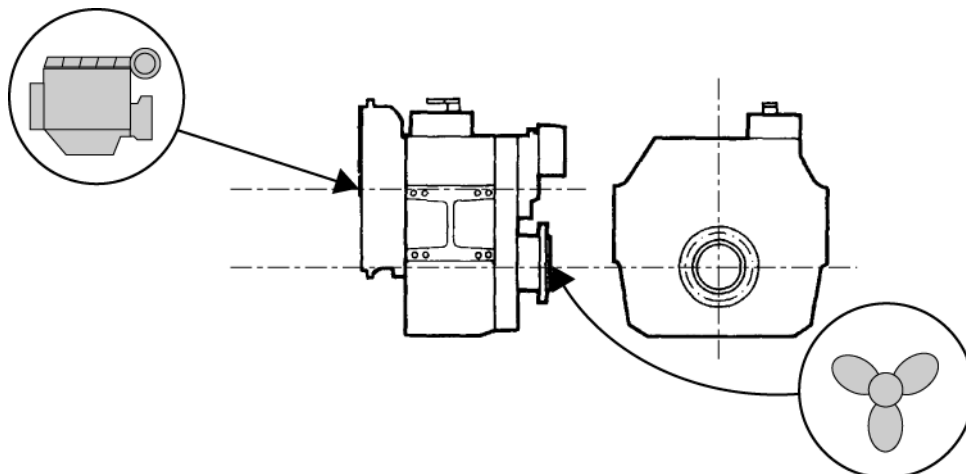


= Connection to propulsion

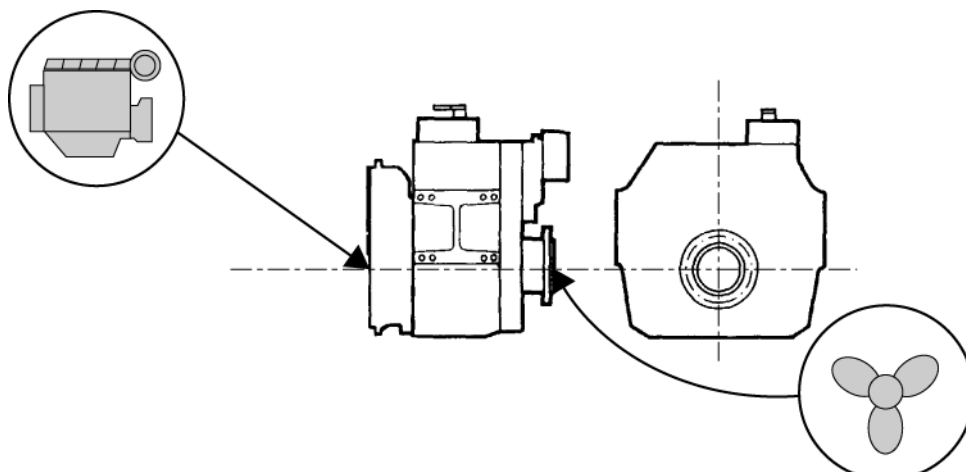
Down Angle



Vertical / Parallel Offset



Coaxial or Near Coaxial





13-litre engines Marine transmissions and equipment

Marine transmissions, Twin Disc																					
Included flexible coupling ¹⁾	Vertical Offset coupling ¹⁾	Ratio	Optional equipment, Twin Disc																		
			Control valve Mech.	El. (12VDC/ 24VDC)	Live PTO	Clutchable; Mech. PTO Control valve	Clutchable; El. PTO Control valve	Shaft drive PTO Clutchable; Mech. PTO Control valve	Trolling valve Mech. control valve	Companion flange	Monitoring Pressure Gauge (loose)	Temp. Gauge and Switch (loose)	Classification of transmission and flexible coupling ABS, LR, RINA, BV, GL ⁴⁾								
Parallel Offset coupling ¹⁾	ZF 325-1 ZF 360 ZF 500	Ratio	Std	O	O	O	O	O	O	O	O	O	O								
			NA	Std*	O ²⁾	NA	O	NA	NA	NA	O	O	O								
			Std	O	O	O	O	O	O	O	O	O	O								
			NA	Std*	O ³⁾	NA	O	NA	NA	NA	O	O	O								
			Std	O	O	NA	O	NA	NA	NA	O	O	O								
			NA	Std*	O ³⁾	NA	O	NA	NA	NA	O	O	O								
Down Angle	ZF 325-1 A ZF 360 A ZF 500-1 A	Ratio	Std	O	O	O	O	O	O	O	O	O	O								
			NA	Std*	O ²⁾	NA	O	NA	NA	NA	O	O	O								
			Std	O	O	O	O	O	O	O	O	O	O								
			NA	Std*	O ³⁾	NA	O	NA	NA	NA	O	O	O								
			Std	O	O	NA	O	NA	NA	NA	O	O	O								
			NA	Std*	O ³⁾	NA	O	NA	NA	NA	O	O	O								
Marine transmissions, ZF																					
Included flexible coupling ¹⁾	Parallel Offset coupling ¹⁾	Ratio	Control, Actuator, Distributor			Live PTO		Clutchable PTO		Control for Clutchable PTO		Companion flange		Monitoring Adapter Kit		Classification of transmission and flexible coupling ABS, LR, RINA, BV, GL ⁴⁾					
			Mech.	El.	Kit El. Valves (24V/12V) On/Off	SAE A	SAE B	SAE C PAD	SAE B PAD	SAE C PAD	Clutchable PTO Pulley appl.	Mech.	El.	Kit El. Valves (24V/12V) On/Off	Trolling kit Mech.		El.	Prop shaft flange	Bolt set for flange	For Appl. with MB30 EB31	
			O	O	O	O	O	NA	O	NA	NA	O	O	O	O		O	O	O	O	O
			O	O	O	NA	O	O	O	O	O	O	O	O	O		O	O	O	O	O
			O	O	O	NA	O	O	O	O	O	O	O	O	O		O	O	O	O	O
			O	O	O	NA	O	O	O	O	O	O	O	O	O		O	O	O	O	O

Marine transmissions, ZF			Optional equipment, ZF																			
Included flexible coupling ¹⁾	Parallel Offset	Ratio	Control, Actuator, Distributor			Live PTO			Clutchable PTO		Clutchable PTO		Control for		Trolling kit		Companion flange		Monitoring Adapter Kit		Classification	
			Mech. El.	Kit El.	Valves (24V/12V)	SAE A	SAE B	SAE C	SAE B	SAE C	SAE B	SAE C	Mech. El.	Kit El.	Valves (24V/12V)	Mech. El.	Prop shaft set for flange	Bolt set for flange	For Appl. with MB30 EB31	For Appl. with MB30 EB31		
Parallel Offset coupling ¹⁾	ZF 325-1	E-4011	0	0	On/Off	0	0	0	NA	0	NA	0	0	0	0	0	0	0	0	0	0	
	ZF 360	E-4011	0	0	0	0	NA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	ZF 500	L-3012	0	0	0	0	NA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Down Angle	ZF 325-1 A	E-4011	0	0	0	0	0	0	NA	0	NA	0	0	0	0	0	0	0	0	0	0	0
	ZF 360 A	E-4011	0	0	0	0	NA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	ZF 500-1 A	L-3012	0	0	0	0	NA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	

Standard Equipment									
Included in the Marine Transmission prices are following parts:									
SAE J617 Housing No 1									
Flexible Coupling for 14"									
Control Valve									
Oil Strainer Mounted									

NA = Not Available
Std = Standard Equipment
O = Optional Equipment

*) Including EC050 profile module (12/24VDC). Other control valve options are available upon request.

1) Example of available flexible couplings. Depending on results from torsional vibration analysis other alternatives are available upon request.

2) Live PTO, max. 593 Nm with integrated bracket for oil filter and heat exchanger.

3) Live PTO, max. 593 Nm with integrated bracket for heat exchanger.

4) Other class upon request.



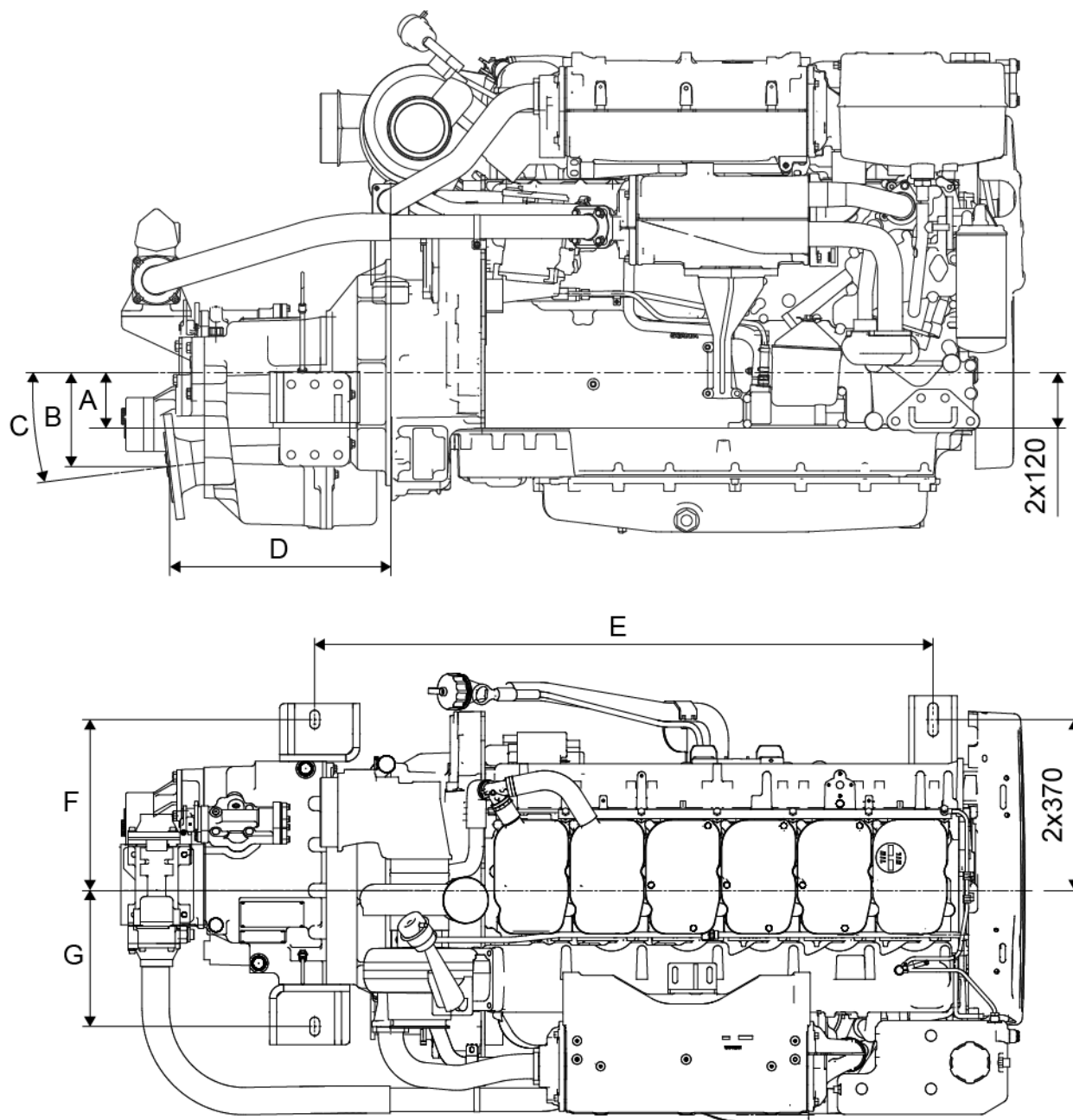
13-litre engines Recommendation list of transmissions

Engine type Power kW (hp)/rpm		Rating	Twin Disc												ZF				
			MG-5095 SC Ratio 1:1.15 / 1.27 / 1.47 / 1.71 / 2.00 / 2.46 / 2.95	MGX-5095 SC Ratio 1:1.15 / 1.27 / 1.47 / 1.71 / 2.00 / 2.46 / 2.95	MG-5114 SC Ratio 1:0.93 / 1.02 / 1.12 / 1.50 / 1.74 / 2.04 / 2.54 / 3.00	MGX-5114 SC Ratio 1:0.93 / 1.02 / 1.12 / 1.50 / 1.74 / 2.04 / 2.54 / 3.00	MG-5135 SC Ratio 1:1.10 / 1.28 / 1.48 / 1.73 / 2.04 / 2.57 / 2.90	MGX-5135 SC Ratio 1:1.10 / 1.28 / 1.48 / 1.73 / 2.04 / 2.57 / 2.90	MG-5095 A Ratio 1:1.26 / 1.52 / 1.81 / 2.04 / 2.48	MGX-5095 A Ratio 1:1.26 / 1.52 / 1.81 / 2.04 / 2.48	MG-5114 A Ratio 1:1.03 / 1.20 / 1.48 / 1.75 / 1.92 / 2.04 / 2.50	MGX-5114 A Ratio 1:1.03 / 1.20 / 1.48 / 1.75 / 1.92 / 2.04 / 2.50	MG-5135 A Ratio 1:1.16 / 1.25 / 1.53 / 1.79 / 2.00 / 2.52	MGX-5135 A Ratio 1:1.16 / 1.25 / 1.53 / 1.79 / 2.00 / 2.52	ZF 325-1 Ratio 1:1.00 / 1.459 / 1.727 / 2.033 / 2.500 / 2.957	ZF 360 Ratio 1:1.00 / 1.237 / 1.500 / 1.774 / 1.966 / 2.185 / 2.480 / 2.625 / 2.917	ZF 500 Ratio 1:0.925 / 1.000 / 1.125 / 1.237 / 1.500 / 1.774 / 1.966 / 2.185 / 2.480 / 2.625 / 2.917	ZF 325-1 A Ratio 1:1.216 / 1.485 / 1.733 / 2.037 / 2.417	ZF 360 A Ratio 1:1.00 / 1.237 / 1.500 / 1.774 / 1.966 / 2.185 / 2.480 / 2.625 / 2.917
DI13 070/071M 294 (400)/1800	ICFN	x	x	x	x	x	x	x	x	x	x	x		x	x		x	x	
DI13 070/071M 331 (450)/1800	ICFN			x	x ≤2.54	x	x		x ≤2.04	x ≤2.04	x	x			x			x	
DI13 070/071M 368 (500)/1800	ICFN					x	x				x	x			x ¹⁾			x ≤2.478	
DI13 070M 405 (550)/1800	ICFN					x	x				x	x			x ²⁾			x ≤2.192	
DI13 073/078M 331 (450)/2100	IFN	x	x	x	x	x	x	x	x	x	x	x	x ^o ≤2.500	x	x	x ^o	x	x	
DI13 073/078M 368 (500)/2100	IFN	x ^o ≤2.46	x ^o ≤2.46	x	x	x	x		x ≤2.04	x ≤2.04	x	x	x ^o ≤2.250	x	x	x ^o ≤2.240	x	x	
DI13 073/078M 405 (550)/2100	IFN			x ≤2.54	x ≤2.54	x	x				x	x		x ^o	x ≤2.625		x ^o	x	
DI13 072M 441 (600)/2300	IFN			x ^o ≤2.54	x ^o ≤2.54	x	x				x	x		x ^o	x ≤2.185		x ^o	x ≤2.192	
DI13 072M 478 (650)/2300	Patrol craft long			x	x	x	x		x ≤2.04	x ≤2.04	x	x	x ^x ≤2.500	x	x	x	x	x	
DI13 077M 515 (700)/2300	Patrol craft long			x	x	x	x				x	x	x ^x ≤2.250	x	x	x ^x ≤2.250	x	x	
DI13 077M 551 (750)/2300	Patrol craft short	x ≤2.46	x ≤2.46	x	x	x	x	x ^x ≤2.04	x ^x ≤2.04	x	x	x		x ^x ≤2.625	x		x	x	

x = full capability relative Scania and Twin Disc/ZF ratings
o = limited capability, according to Twin Disc/ZF Medium rating
(The figures indicate if there is a limitation in ratio)
1) up to ratio 2.480 (except 0.925 and 1.000)
2) up to ratio 2.185 (except 0.925 and 1.000)



13-litre engines Dimensions



19:5263

Transmission	A (2x)	B	C	D	E (2x)	F	G	Drawing
<i>Twin Disc</i>								
MG/MGX-5095 SC	120	190	0°	431.7	1362	356	356	2 099 484
MG/MGX-5114 SC	120	190	0°	482.6	1333	370	370	2 099 485
MG/MGX-5135 SC	115	200	0°	534.9	1342.8	405	405	2 099 488
MG/MGX-5095 A	120	189	7°	431.8	1316.2	356	356	2 099 483
MG/MGX-5114 A	120	203.2	7°	478.5	1338.3	370 / 446	294 / 370	2 101 409
MG/MGX-5135 A	120	230.9	10°	520.2	1342.8	405	405	2 099 487
<i>ZF</i>								
ZF 360	120	180	0°	544	1405	390	390	2 099 990
ZF 360 A	117	195	7°	495	1396	380	380	2 099 992



16-litre engines Marine transmissions and equipment

Marine transmissions, Twin Disc		Optional equipment, Twin Disc									
Included flexible coupling ¹⁾	Vertical Offset Ratio	Control valve		Pump-mounted PTO 4-bolt SAE-C		Shaft drive PTO		Trolling valve		Companion flange	
		Mech.	El. (12VDC/24VDC)	Live PTO	Clutchable; Mech. PTO Control valve	Clutchable; El. PTO Control valve	Clutchable; Mech. PTO Control valve	Mech. control valve	El. control valve	Pressure Gauge (loose)	Temp. Gauge and Switch (loose)
MG-5135 SC	E-4911 S	Std	O	O	NA	O	NA	O	O	O	O
MGX-5135 SC	E-4911 S	NA	Std*	O ²⁾	NA	O	NA	NA	NA	O	O
MGX-5145 SC	E-4911 S	NA	Std	O	NA	O	NA	NA	NA	O	O
Down Angle											
MG-5135 A	E-4911 S	Std	O	O	NA	O	NA	O	O	O	O
MGX-5135 A	E-4911 S	NA	Std*	O ³⁾	NA	O	NA	NA	NA	O	O
MGX-5145 A	E-4911 S	NA	Std	O	NA	O	NA	NA	NA	O	O

Marine transmissions, ZF		Optional equipment, ZF									
Included flexible coupling ¹⁾	Vertical Offset Ratio	Control, Actuator, Distributor		Live PTO		Clutchable PTO		Clutchable PTO		Control for	
		Mech. El.	Kit El. Valves (24V/12V) On/Off	SAE A	SAE B	SAE C	SAE B PAD	SAE C PAD	Pulley appl.	Mech. El.	Clutchable PTO
Parallel Offset											
ZF 500	L-3012	O	O	NA	O	O	O	O	O	O	O
ZF 665	L-3012	O	O	NA	O	O	O	O	O	O	O
ZF 2050	To be completed										
Down Angle											
ZF 500-1 A	L-3012	O	O	NA	O	O	O	O	O	O	O
ZF 665 A	L-3012	O	O	NA	O	O	O	O	O	O	O
ZF 2050 A	To be completed										

NA = Not Available
Std = Standard Equipment
O = Optional Equipment

*) Including EC050 profile module (12/24VDC). Other control valve options are available upon request.
1) Example of available flexible couplings. Depending on results from torsional vibration analysis other alternatives are available upon request.
2) Live PTO, max. 593 Nm with integrated bracket for oil filter and heat exchanger.
3) Live PTO, max. 593 Nm with integrated bracket for heat exchanger.
4) Other class upon request.

Standard Equipment		Suspension for transmission, 2 points	
Included in the Marine Transmission prices are following parts:		D16 fixed (low)	O
SAE J617 Housing No 1		D16 stiff (low)	O
Flexible Coupling for 14"			
Control Valve		Only for Twin Disc	
Oil Strainer Mounted		Only for Twin Disc	



16-litre engines Recommendation list of transmissions

Engine type Power kW (hp)/rpm		Rating	Twin Disc						ZF					
			MG-5135 SC Ratio 1:1.10 / 1.28 / 1.48 / 1.73 / 2.04 / 2.57 / 2.90	MGX-5135 SC Ratio 1: 1.10 / 1.28 / 1.48 / 1.73 / 2.04 / 2.57 / 2.90	MGX-5145 SC Ratio 1:1.03 / 1.20 / 1.33 / 1.48 / 1.75 / 1.96 / 2.50	MG-5135 A Ratio 1:1.16 / 1.25 / 1.53 / 1.79 / 2.00 / 2.52	MGX-5135 A Ratio 1:1.16 / 1.25 / 1.53 / 1.79 / 2.00 / 2.52	MGX-5145 A Ratio 1:1.26 / 1.48 / 1.75 / 1.96 / 2.50	ZF 500 Ratio 1:0.925 / 1.000 / 1.125 / 1.237 / 1.500 / 1.774 / 1.966 / 2.185 / 2.480 / 2.625 / 2.917	ZF 665 Ratio 1:1.111 / 1.182 / 1.262 / 1.400 / 1.500 / 1.743 / 2.000 / 2.233 / 2.593 / 3.042	ZF 2050 Ratio 1:1.086 / 1.250 / 1.350 / 1.436 / 1.500 / 1.639 / 1.765 / 2.032 / 2.276 / 2.519	ZF 500-1 A Ratio 1:1.216 / 1.485 / 1.767 / 1.964 / 2.192 / 2.478 / 2.609	ZF 665 A Ratio 1:1.525 / 1.757 / 1.971 / 2.226 / 2.448 / 2.517 / 2.960	ZF2050 A Ratio 1:1.267 / 1.512 / 1.763 / 2.029 / 2.250 / 2.467
DI16 070/071/079M 405 (550)/1800	ICFN	x	x	x	x	x	x	x ¹⁾	x ≤2.593	x	x ≤2.192	x	x	
DI16 070/071/079M 460 (625)/1800	ICFN			x			x		x ≤2.593	x		x ≤2.517	x	
DI16 070/079M 515 (700)/1800	ICFN			x ≤1.96			x ≤1.96		x ≤2.000	x		x ≤1.971	x	
DI16 070/079M 552 (750)/1800	ICFN			x ≤1.96			x ≤1.96			x			x	
DI16 072/073M 477 (650)/2100	IFN	x ≤2.57	x ≤2.57	x	x	x	x	o ≤2.625	x ≤2.593	x	o ≤2.478	x ≤2.517	x	
DI16 072/073M 515 (700)/2100	IFN	o ≤2.57	o ≤2.57	x			x	o ¹⁾ ≤2.000	x ≤2.000	x	o ≤2.192	x ≤1.971	x	
DI16 072/073M 551 (750)/2100	IFN			x			x	o ≤1.966	o ≤2.593	x	o ≤1.964	o ≤2.517	x	
DI16 072/073M 588 (800)/2100	IFN			x ≤1.96			x ≤1.96		o ≤2.593	o		o ≤2.517	o	
DI16 072M 588 (800)/2300	Patrol craft long	x ≤2.57	x ≤2.57	x	x	x	x	x	x	x	x	x	x	
DI16 072M 625 (850)/2300	Patrol craft long			x			x	x ≤2.625	x	x	x	x	x	
DI16 077M 662 (900)/2300	Patrol craft long			x			x	x ≤2.625	x	x	x	x	x	
DI16 072M 662 (900)/2300	Patrol craft short	x	x	x	x	x	x	x ≤2.625	x	x	x	x	x	
DI16 077M 736 (1000)/2300	Patrol craft short	x ≤2.04	x ≤2.04	x	x ≤2.00	x ≤2.00	x	x ≤2.185	x ≤2.593	x	x ≤2.192	x ≤2.517	x	

x = full capability relative Scania and Twin Disc/ZF ratings
o = limited capability, according to Twin Disc/ZF Medium rating
(The figures indicate if there is a limitation in ratio)
1) up to ratio 2.185 (except 0.925 and 1.000)



Twin Disc ratings

Pleasure Craft

Up to 500 hours/year, low load factor usage planing hull vessels where typical full engine throttle operation is less than 10% of total time. The balance of operation at 80% of full engine throttle or less. Marine transmissions for use in long range pleasure cruisers, sportfish charter boats/patrol boats do not qualify for Pleasure Craft Service. Note: Some revenue producing applications such as Planing Hull Bristol Bay Gillnetter do qualify under Pleasure Craft rating definition.

Light Duty

Relatively low hour usage (less than 1500 hours/year) where full throttle operation is 2 hours out of 12. Typical applications include planing hull vessels such as fire boats, sportfish charter boats, and patrol/customs boats. This rating is also applicable to some bow and stern thruster applications.

Intermediate Duty

Hour usage of up to 2000 hours/year (for models MG-5114 and smaller) and up to 3000 hours/year (for models larger than MG-5114) with 50% of the operating time at full engine rating. Typical applications include planing hull vessels such as ferries, fishing boats, some crew boats, and also some displacement hull yachts as well as some bow and stern thruster applications.

Medium Duty

Hour usage of up to 4000 hours/year with up to 80% of operating time at full engine power. This duty classification is for usage where some variations in engine speed/power occur as part of normal vessel operation. Typical vessels include mid-water trawlers, crew/supply boats, ferries, and some inland water tow boats.

Continuous Duty

For use in continuous operation with little or no variation in engine speed/power settings. Typical vessels include fishing trawlers, tow/tug boats and ocean going vessels.

ZF ratings

Pleasure duty

Highly intermittent operation with very large variations in engine speed and power. Average engine operating hours limit: 500 hours/year 300 hours/year for mechanical gearboxes. Typical hull forms: Planing. Typical applications: Private, non-commercial, non-charter sport/leisure activities.

Light duty definition

Intermittent operation with large variations in engine speed and power. Average engine operating hours limit: 2500 hours/year (for hydraulic transmissions smaller than ZF 2000 series, 2000 hours/year). Typical hull forms: Planing and semi-displacement. Typical applications: Private and charter, sport/leisure activities, naval and police activities.

Medium duty definition

Intermittent operation with some variations in engine speed and power. Average engine operating hours limit: 4000 hours/year (for hydraulic transmissions smaller than ZF 2000 series and workboat ZF W2700 series, 3500 hours/year). Typical hull forms: Semi-displacement and displacement
Typical applications: Charter and commercial craft (example: crew boats), and naval and police activities.

Continuous duty definition

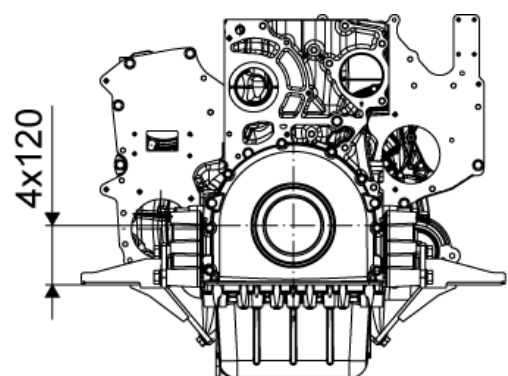
Continuous operation with little or no variations in engine speed and power. Average engine operating hours limit: Unlimited. Typical hull forms: Displacement. Typical applications: Heavy duty commercial vessels.



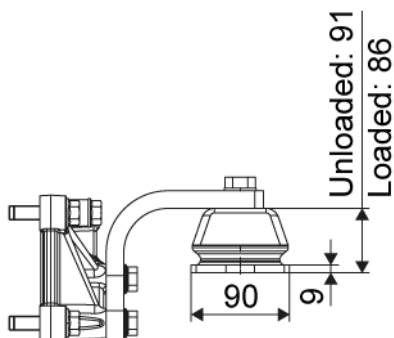
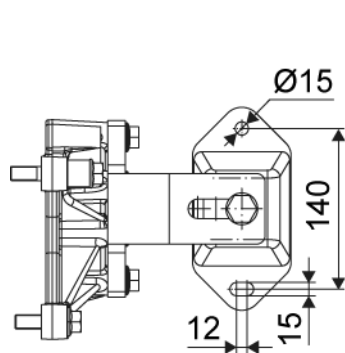
Engine suspension

Included as standard engine suspension are fixed low, front-mounted brackets. Front- and rear-mounted fixed low brackets are available as option.

With fixed low brackets the measurement from the crankshaft centre is 120 mm. The suspensions are also available with stiff rubber, see pictures below.



1:7137b



1:7138



How to order Marine transmissions

Marine transmissions are handled within the regular S-order process, via PRS (Product Request System). PRS is accessible via SAIL at <http://sail.scania.com>.

Information about how to place an S-order request is found in the PRS handbook. In PRS there is a Product Request form where you can choose from the Marine transmissions available in the Scania assortment. You choose both Marine transmissions and all requested optional equipment here. See picture below.

If your inquiry does not correspond to any alternative, please write your complete request including all parts of the Marine transmission under 'Requested items'.

For access to PRS, please send an e-mail to: s-order.indmar@scania.com.

PRODUCT REQUEST

Requested items:

MARINE TRANSMISSION AND OPTIONAL EQUIPMENT:

Manufacture:

(None)

Offset:

(None)

Down Angle:

(None)

Coaxial or near Coaxial:

(None)

Flexible Coupling:

(None)

Flexible Coupling – Other Alternative:

Ratio:

(None)

Control Valve:

(None)

Trolling Valve:

(None)

Pump mounted PTO 2-Bolt SAE-B:

(None)

Companion Flange:

☐

Pump mounted PTO 4-Bolt SAE-C:

(None)

Classification Society, transmission and flexible coupling:

(None)

Shaft drive PTO:

(None)

Classification Society – Other Class:

Clutchable PTO (ZF):

(None)

